Bind with Ads in (5)

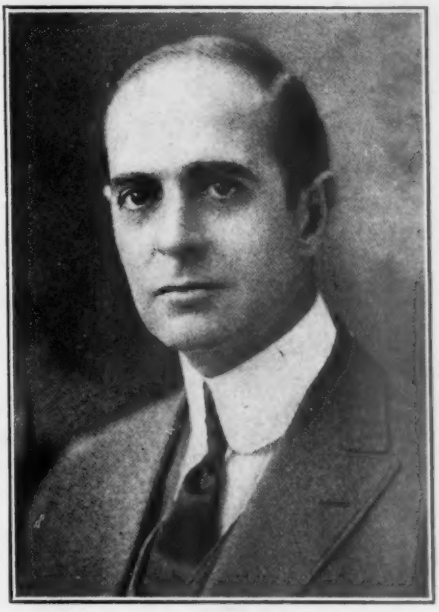
THE MINING CONGRESS JOURNAL

JANUARY, 1919

VOL. V

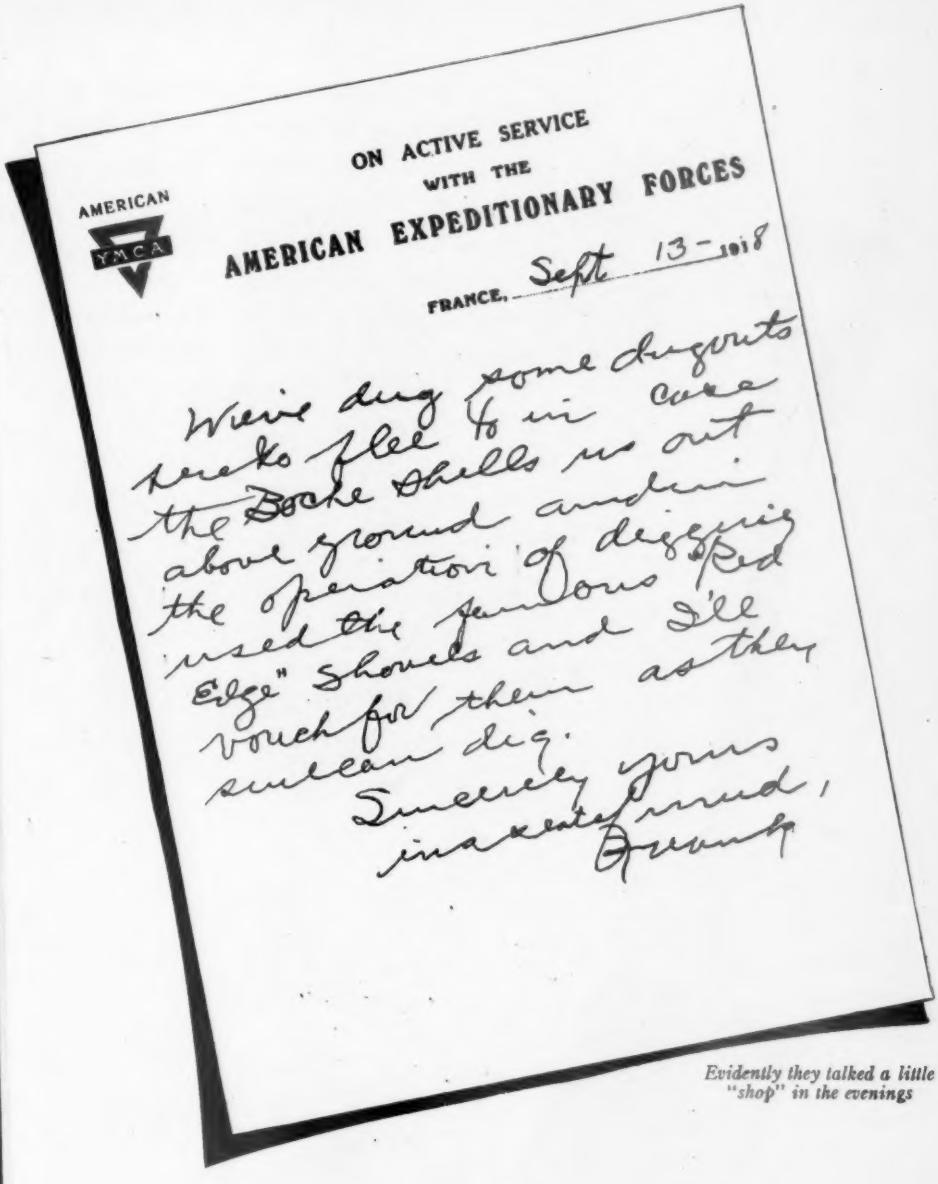
SAFETY—EFFICIENCY—CONSERVATION

No. 1



BULKELEY WELLS
PRESIDENT AMERICAN MINING CONGRESS

PUBLISHED BY
THE AMERICAN MINING CONGRESS
PUBLICATION OFFICE
MUNSEY BUILDING WASHINGTON, D. C.
$ 2.00 PER YEAR 20 ¢ PER COPY



AMERICAN Y.M.C.A.

ON ACTIVE SERVICE
WITH THE
AMERICAN EXPEDITIONARY FORCES

FRANCE, Sept 13 - 1918

We've dug some dugouts
to flee to in case
the Boche shells us out
above ground and in
the operation of digging
used the famous "Red
Edge" shovels and I'll
vouch for them as they
sure can dig.
Sincerely yours
in a state of mud,
Frank

Evidently they talked a little "shop" in the evenings

HERE is a small section of a letter received by the stenographer in one of our sales offices. We wanted to quote the entire letter but naturally the

young lady said "no."

It is thoroughly understood what a big part Hand Shovels have taken in this War.

Think of the hundreds of miles of Trenches and New Roads.

Do you remember the early laments of our Doughboys;—

"I bet I've shoveled a hundred tons of dirt and haven't killed a D--d dutchman yet." and "I thought I came over here to fight, not to dig a sewer system for France."

We are glad that Red Edge Shovels had an important role and played that role exceedingly well.

THE WYOMING SHOVEL WORKS
WYOMING, PENNSYLVANIA

WYOMING
RED EDGE
SHOVELS

Getting Water
Getting Rid of Water

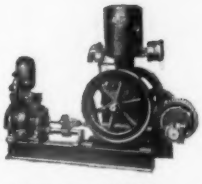
The prospector or mine operator is always confronted by one of these problems—sometimes by both.

Novo Complete Pumping Outfits meet these needs with lowest first cost, lowest operating cost, and solid, enduring efficiency.

Combining a perfected engine and a perfected pump, Novo Type U and Triplex Pumping Outfits are unequaled for pumping water from long distances and against high heads. Type U, compact and portable, will pump a two-inch stream against a three-mile head, day in and day out, with minimum attention. Novo Triplex Pumping Outfit is a heavy duty pump especially adapted to the requirements of mining work.

There are more than 75 types and sizes of Novo Outfits, including Hoists, Pumping Outfits, Air Compressor Outfits, Combination Compressor and Hoisting Outfits. All Novo Outfits are engine-driven and furnished complete with Novo Engine. Furnished to operate on gasoline, kerosene or distillate.

Write to us for further information. Our engineering department is at your service to aid you in selecting the right equipment for your needs.



Novo Type U High Pressure Pumping Outfit

Novo Type M Hoisting Outfit

NOVO ENGINE CO.
Clarence E. Bement, Vice-Pres. & Gen. Mgr.
925 Porter Street, Lansing, Michigan

NOVO
REG. U.S. PAT. OFF.
ENGINES and OUTFITS

THE MINING CONGRESS JOURNAL

EDITORIALS

METALS, ETC.

COAL

OIL

MISCELLANEOUS

Consider The Future

In Providing for the Present Crisis

The millions of extra tons demanded for immediate use require modern gathering equipment that can be installed quickly, without interfering with maximum production from your present equipment.

Standardized Ironton Storage Battery Locomotives will not only measure up to the requirements of the present crisis, but will insure low cost and permanent satisfaction in operation for years to come.

Installation of Irontons can be quickly accomplished without interfering with present methods in use. They can be operated on almost any kind of track—require no bonded rails or trolley wires, and consume less current than locomotives that require these expensive accessories.

Irontons cost less for upkeep and care than do the mules they displace, and they increase the efficiency of workmen through improved sanitary conditions and elimination of drudgery.

Whether you plan to discard mules or modernize the mechanical gathering and haulage equipment now in use there's an Ironton Storage Battery Locomotive that will prove a profitable investment for both **Present** and **Future** needs.

Irontons are the product of a modern factory devoted exclusively to the manufacture of Storage Battery Locomotives. The use of standard jigs and gauges make all parts of each type interchangable, and duplicate parts are quickly available from stock.

For quick action wire our nearest office. A representative will submit definite information on the adaptability of Ironton Locomotives to conditions in *your* mines.

THE IRONTON ENGINE CO., Main Office and Factory, Ironton, Ohio

Branch Offices.—1116 Fidelity Mutual Bldg., Philadelphia, Pa. Keiser-Geismer Engineering Co., Birmingham, Ala. Stock Exchange Bldg., 314 N. 4th St., St. Louis, Mo. 408 Gas & Electric Bldg., Denver, Colo. 69 Columbia St., Seattle, Wash. 584 Union Arcade Bldg., Pittsburgh, Pa. Pineville, Ky Columbus, O.

3 Types

THE IRONTON
STORAGE BATTERY LOCOMOTIVES

14 Sizes

COOPERATE

Why?

Because nothing worth while can be accomplished without

Cooperation

When?

Right now. Your assistance is needed more than it ever has been, to secure for the mining industry proper recognition of its importance in National

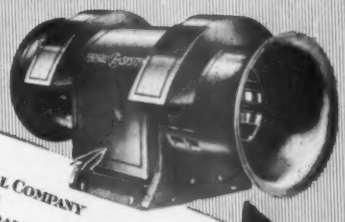
Reconstruction

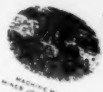
Where?

With **THE AMERICAN MINING CONGRESS,** the organization representing every phase of the mining industry; the organization that *HAS* secured results; the organization that has the confidence and cooperation of the agencies to which we must look for assistance; the organization with

Vision

A Federal Electric Siren replaces Three former Signals





VALLEY SMOKELESS COAL COMPANY
MINERS AND SHIPPERS
VALLEY SMOKELESS COALS
PHILADELPHIA

C. C. DOVEY, GENERAL SUPERINTENDENT
JOHNSTOWN TRUST BUILDING

JOHNSTOWN, PA. Sept. 21, 1918.

Federal S.T. System Electric Co.,
Lake & Desplaines Sts.,
Chicago, Ill.

Gentlemen—

We are pleased to advise the Double Head Federal Siren Purchased several months ago, and in use during the past month, has proven entirely satisfactory in every respect. It has a very loud, clear, distinct sound, and in our particular case, regulates the starting and stopping periods of work for three mines which heretofore, required three signals of other character than the Federal.

Yours very truly,
VALLEY SMOKELESS COAL CO.
General Superintendent

CCD-S.

That Weird Penetrating Screech— Commands Instant Action

MINES using Federal Electric Sirens are invariably pleased with the way it stimulates promptness and quick action. Everyone hears it, asleep or awake. Everyone knows it is his call. Federal Sirens are operated from switches located in the office, power house or wherever desired. Operating cost averages $2.00 per year—no other maintenance expense.

Send coupon for full information and names of mines using them.

Federal Sign System (Electric)
Lake and Desplaines Sts.
Chicago, Ill.

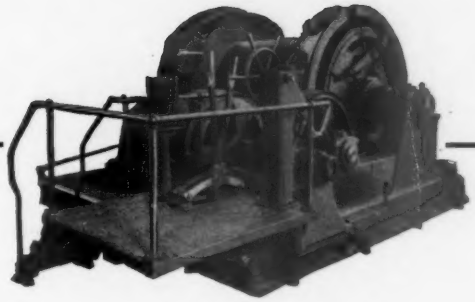
COUPON — Federal Sign System (Electric), Lake & Desplaines St. Chicago

Please send full particulars concerning Federal Electric Sirens with names of mines using them.

Name _____

Company _____

Address _____



INBUILT ENDURANCE

Vulcan Hoists are built to work uncomplainingly, day after day—year in and year out. Many Vulcans are in as good condition after ten years of hard work as they were when installed.

Vulcan Hoists are easily operated. They are equipped with every known device to insure safety. Vulcans cannot overtravel in either direction. They cannot be started in the wrong direction; cannot be operated above a given maximum speed; cannot approach top or bottom landing unless speed is retarded at the proper rate; cannot fail to stop due to badly worn brakes.

VULCAN HOISTS

And there are 29 other safety control features.

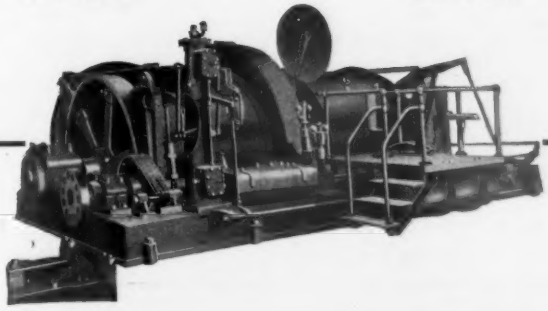
For the past 70 years Vulcan Hoists have stood for the best of workmanship, the best of material and the best of service.

A Vulcan can make good for you. Send for our interesting catalog, and tell us your hoisting problems.

VULCAN IRON WORKS

1736 Main Street Wilkes-Barre, Pa.

CHICAGO **NEW YORK**



HERCULES POWDER CO.

Backing The Fighter

Back of our fighting man in France stands the mechanic who labors in our factories and munition plants. Back of the mechanic stands the miner whose broad back bends to his task in the dark heart of some mountain. And back of the miner stands the power of explosives, loosening the grip of Mother Earth on her wealth of metals and minerals.

Without the gigantic force o explosives it would be utterly impossible for us to produce in sufficient quantities the munitions to supply our armies over there; the steel to build our battleships; the coal whose latent energy turns the wheels of our great manufacturing plants; the copper which goes to make our dynamos, cables, and shell casings; the gold which helps us carry the great financial burden of the war.

The Hercules Powder Co. is supplying a very large proportion of the explosives used by American miners, to whose patriotic labor is due, in no small degree, our present vast production of the materials of war.

HERCULES POWDER CO.

Chicago	Joplin	Memphis	San Francisco
Denver	Pittsburg, Kan.	New York	St. Louis
Hazleton, Pa.	Pittsburgh, Pa.	Salt Lake City	Wilmington, Del.

The "Ironclad-Exide" Battery

FOR MINE LOCOMOTIVES

There are two separate and distinct characteristics of a storage battery and upon which its selection for use on the Mine Locomotive must be based.

One is power--the other Durability.

Both are essential if anything approaching truly successful operation of the Mine Locomotive is to be attained. In

The "Ironclad-Exide" Battery

Both these characteristics are provided for---they are built in.

There is nothing experimental in the "Ironclad-Exide" It has stood the test of actual service for many years in some of the largest and most productive mines in the country. Wherever the "Ironclad-Exide" is used, greater haulage, reduced haulage costs and general speeding up of labor is the rule---not the exception. The special positive plate construction, patented cell cover and non-flooding filling plug are a few of the exclusive "Ironclad-Exide" features which render it easy to care for and maintain at a minimum of cost.

Our nearest sales office will explain what the "Ironclad-Exide" Battery has accomplished for others and what it will accomplish for you.

THE ELECTRIC STORAGE BATTERY CO.

1888 PHILADELPHIA 1918

PITTSBURGH	SAN FRANCISCO	CLEVELAND	ROCHESTER	BOSTON
DETROIT	ATLANTA	DENVER	WASHINGTON	NEW YORK
CHICAGO	KANSAS CITY	ST. LOUIS	MINNEAPOLIS	TORONTO

VOL. 5, NO. 1 WASHINGTON JANUARY, 1919

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

A PREPAREDNESS CAMPAIGN

The executive committee selected by the American Gold Conference, held in Reno, August 12 last, after spending some weeks in Washington, have decided that further effort at this time will be without avail. The committee consisted of Governor Emmet D. Boyle of Nevada, General Bulkeley Wells of Colorado, J. A. Fulton of California, Whitman Symmes of Nevada, and W. J. Loring of California.

At the time of the conference it was urged that the United States Congress was then in the humor to consider propositions of this kind, that the enormous approprations being made for war purposes was such as to accentuate the necessity of increasing the gold supply, that it was anticipated that the war would continue for a considerable length of time, possibly two or three years, and that the continually increasing costs of operation were gradually strangling the gold-producing industry, and that these conditions created a psychological opportune time to ask aid from Congress to enable the gold mining industry to continue production. As a matter of fact, the need of an increasing gold supply is an after-war problem and not a war problem. During the war all gold reserves were locked up by governmental embargoes and commercial life, born of the patriotic impulses of the people, were such as to make the temporary need of gold much less than it will be when these special reasons have passed away and when the time has come for the liquidation of the vast indebtedness which was then being piled up by all the nations engaged in the war.

The interest of Congress in these matters was evidenced by the appointment of a committee to investigate the situation. The administration was alive to the question, which was evidenced by the appointment by the Interior Department of a committee to make report upon the physical condition concerning gold mining. The Secretary of the Treasury publicly announced his belief in the vital importance to the financial world of maintaining the normal production of gold. THE MINING CONGRESS JOURNAL then urged immediate action looking to the relief of the then situation in order that gold mines which were then operating at a loss and which could not continue to operate for any length of time, could continue production if some certain assurrance were given that continuation of operation mght lead to conditions under which low-grade mines might be made self-sustaining.

The committee of the American Gold Conference believed it necessary that more complete information should be gathered concerning the condition of the gold mines of the country, their costs of operation and the exact measure of the aid which would be required to keep these mines in operation. Nearly four months was spent by this committee gathering the requisite data; in the meantime, active war operation has been terminated by the signing of the armistice, a trend of conditions which was the basis of the appeal for aid to the gold industry, viz., the upward trend of prices

had come to an end and future conditions promised a gradual return to an era of lower prices. There is no probability that prices will, for many years, be reduced to a level which will permit the successful operation of the great low-grade ore bodies, and the need of increased gold production will be felt when the time for payment of our stupendous bond obligations shall approach. Notwithstanding these conditions, the opportunity for securing aid for the gold mining industry was allowed to pass by because of the fact that no agency had been created having instantly available all of the necessary data concerning gold mining which was thought necessary by the committee in presenting this matter to the governmental authorities.

THE MINING CONGRESS JOURNAL believes that the losing of this great opportunity is a public calamity, because of which the public will suffer for many, many years to come. A temporary inconvenience will be caused the operators of gold mines, which will be recouped many fold as the wheel of opportunity carries the gold mining business from the slough of high prices to the slough of under-valuation of its product to the upper rim of its circle, where the purchasing price of gold will be many times what it is today. The American Mining Congress will be able, before another situation of this kind arises, through the Bureau of Mining Economics which it is now establishing, to supply immediately all of the data required upon which to base a campaign for the maintenance of stable conditions in the mining industry. The mining industry will at once begin, through the American Mining Congress, a campaign of preparedness.

A READJUSTMENT QUESTION

The most serious question involved in the readjustment of business conditions is whether or not the intensified features of government control which have prevailed during the war period are to be continued through the years to come, or whether the present war policy, fully justified for war purposes, is intended to be temporary only, with a return to the ordinary conditions at the earliest time possible.

War conditions made centralized control an absolute necessity. A republican government has demonstrated that it can become an autocracy and still be a democracy, because during the war it was the wish of every loyal citizen that absolute authority should be placed in the hands of the President of the United States, so far as that authority was in any way essential to the mobilizing of every force, the concentration of every power, the commandeering of every supply and the direction of these forces into those channels where greatest service could be rendered in the world war for democracy.

A great democracy becomes an autocracy in order that democracy may prevail. Will the powers that have been voluntarily surrendered to the Federal Government again be returned to the hands of those who developed the great enterprises, which have made possible the nation's success in its present undertakings? The reply to this question will have much to do with the facility through which the readjustment problems will be handled.

GOLD DECREASE SERIOUS

On another page of THE MINING CONGRESS JOURNAL appears a final joint statement of the United States Mint and the Geological Survey, showing the preliminary estimate of the production of gold and silver in the United States during the year 1918.

As an argument in favor of some relief or assistance for gold producers nothing further should be necessary. The gold decrease for the year amounts to $15,257,200, or a loss of 18.01 per cent. The reduction in silver output amounts to 3,861,156 ounces, or a decrease from the 1917 output of 5.03 per cent.

THE MINING CONGRESS JOURNAL suggests that a perusal of the tabulated public statement will be interesting to all mining operators and furnish considerable food for reflection.

EFFICIENCY AND LUXURY

With the exception of food, a belief seems quite general that the conclusion of the war marks the beginning of a general trend toward lower prices. It is not believed, however, that the price level will at any time in the near future again recede to the level of the pre-war period.

So large a percentage of the cost of all products is composed of the labor cost that no great break in commodity prices can be expected, except as the wage factor is proportionately decreased. On the other hand, it is equally true that the wage earner cannot on a lower wage purchase the necessities of life at the present exorbitantly high prices. The holders of stocks of merchandise purchased at high prices cannot be expected to voluntarily dispose of these goods at a loss, and until he does do so, the wage earner, who is forced to pay these high prices, must himself receive a proportionately high wage.

One remedy would lie in the direction of greater efficiency. From a very large number of replies made to a questionnaire sent out by this office to the gold mining companies of the country with a view to discovering the exact conditions in that industry, practically all of the replies were to the effect that wages paid were from 25 to 35 per cent more, while the efficiency of labor was from 35 to 50 per cent less than in the pre-war period.

It would not be feasible at the present time to ask the miner to accept a less wage, but it is entirely feasible that he should be asked to speed his production to the highest limit. It is probable that this same ratio of efficiency or something approximating it will be found in other lines of industry. One of the unpardonable errors of organized labor is based on the theory that if labor shall produce to its fullest capacity, that there will not be enough work to go around, and that a shorter day and decreased production in other ways tend to make jobs for all.

The fact is that cheap production, whether because of superior organization, of invention, or of labor efficiency, has brought the luxuries of life within the reach of the masses. The greater the production the lower the price and the more can be purchased with the wage received. High wages and low efficiency inevitably lead to high prices and scarcity. The maximum efficiency of production machinery is necessary to make available the most of comfort and luxury for the laboring man, as well as for the country a as whole.

The point which is lost sight of by organized labor is that there is no limit on consumption, except the limit of price. As goods become more costly, so costly as to be beyond the reach of the purchasing power of the individual, their use is curtailed or entirely discontinued. This process tends continuously and unerringly toward stagnation, while the production of goods that can be sold at low prices leads to increasing use and frequently to waste, which, while bad for the individual, is good for the general industrial life of the community. It is of little interest to the shoe manufacturer in Massachusetts whether the Joplin lead and zinc producer, who wears out three pairs of shoes annually, is wasteful or not. If he purchases and pays for three pairs of shoes annually for each individual in the community he has made a market for three-quarters of a million pairs of shoes. The Joplinite might be better off if each of the members of his family would wear out but two pairs of shoes annually instead of three pairs. But this would curtail the market of the Lynn manufacturer and prevent steady work to his employees. Some good conservation soul may urge that the unnecessary wearing out of a quarter of a million pairs of shoes annually should be avoided. Theoretically this is true, but practically it would force one-third of the men employed in the Massachusetts shoe factories to seek employment elsewhere. The fact is that the country as a whole is consuming many times more of merchandise per capita than it did 100 years ago. The luxuries of the early days have now become necessities. A large part of the demand for production is based upon the waste of

a certain percentage of the product. The American people do not want to return to the frugal methods of the past. There is no reason why they should return to those conditions, and if it were possible to return, it would mean that from one-third to one-half of the wage earners of the country would be without employment. The cost of production of any article must be such as will permit a price at which the consumer feels that he can afford to buy. The increased efficiency of the wage earners of the country furnishes one method by which prices may be reduced, without a reduction in wages. THE MINING CONGRESS JOURNAL would be glad to have some other plan outlined by which this can be accomplished, without resort to a business panic by which men are thrown out of work until necessity compels the acceptance of a lower wage and more than likely a destructively low wage. THE MINING CONGRESS JOURNAL believes that the price limit should be fixed at that point which will permit a sale of our surplus products in foreign markets. This being permitted, it matters not what prices are, so long as wages and living costs can be maintained upon a proper ratio with respect to each other. It is hoped that this problem will be solved by the selfish intelligence of the nation.

THE REMOVAL OF WAR RESTRICTIONS

The new year opens with the curtailment and restrictions which have been imposed upon industries by war conditions practically brought to a close. Gradually all lines of business, except transportation, will resume old-time conditions upon a ratio of higher prices and commensurately higher profit in the trading world. The readjustment of business conditions is being made as rapidly as can be expected. In some lines the appeal of operators for continued government control has been refused, and gradually every business will be forced to resume its normal position and meet a competition which in some lines threatens to be more fierce than in the pre-war period. Those lines of production in which continuous operation is necessary to preserve the property, where the margin of profit is so low as to require enormous production in order to keep down the overhead charge, in which the productive capacity is in excess of possible consumption, are headed directly toward a chaos of ruinous competition which will, in the end, lead to the demoralization of business from which only the strongest will emerge. The waste of war will some day be refunded. The waste of natural resources, occasioned by a mad scramble to cheapen production costs in order to meet a foolish, a useless and a wholly destructive competition, will create continuing burdens which cooperative foresight might easily avoid.

CHAOTIC RUSSIA AND ITS LESSON

The experience of Russia demonstrates again the extreme difficulty of traveling the road from autocracy to democracy. This great danger lies in the fact that even democracy requires its rules, a fact not appreciated by those who become restive because of the restrictions placed upon them by autocratic control, and who believe that, having eliminated this control, each person will become a law unto himself and enjoy what he deems to be a complete measure of personal liberty.

Unfortunately his neighbor or neighbors may not agree with his theories, and having no power to prevent them interfering with what he believes to be his rights, he feels justified in employing whatever means of protection are at hand.

Physical and mental exercise is necessary to develop strength of body and of mind; discipline is ever essential to growth; self-control requires effort; the individual cannot be trusted at all times to recognize the bounds between liberty and license. The enjoyment of rights which he believes to be his own may so trend upon the rights of another as to provoke animosity and revenge. In-

dividuals must restrain themselves or be restrained by those rules which prescribe their right and duties. Those rules constitute law. There must be some authority to enforce that law, and whatever that authority is is called government. Without government strong enough to enforce that law, anarchy is sure to follow. Without tribunals in which differences of opinions as to these rights may be determined there can be no peaceful community. The powers to enforce those rules constitute the courts of orderly government. Democracy, to be successful, must establish a central controlling agency through which the rights of its individual members are protected. The difference between monarchy and successful democracy lies only in the method of choosing the rules and in making the laws. In making the laws and choosing the agencies of enforcement, Russia's Czar Nicholas accorded to his people as much of liberty, apparently more than they were capable of enjoying. It was an easy matter to dethrone the Czar and destroy the government. It is not an easy matter to reestablish government. Kaiser Wilhelm may not have been a satisfactory ruler, but his abdication leaves no government behind, and it seems probable that in both Russia and in Germany the allied troops will be forced to take possession and establish a government in order to protect the people against themselves. Mexico has been torn by dissension for years. The destruction of the Diaz government was hailed as the dawn of liberty for the Mexican people. The Mexican people fought for liberty and obtained what was worse than slavery. The Russian people dethroned autocracy and replaced it with starvation, murder and rapine. To all of these peoples a return to the old conditions would be unanimously hailed with delight. In the United States there would seem to be no valid reason for agitation against the Government, and yet in every city of the Union, street corner crowds are, and have been, listening to appeals for united action against the established order of things. No word is more dear to the human heart than liberty.

No great country in the history of the world has brought to all of its citizens a greater degree of liberty and opportunity than has the United States. There is still opportunity for improvement, but there would seem to be no justification for revolutionary changes. Much of effort is worse than wasted to secure reforms which do not reform. The much-heralded benefits which were expected from primary election laws have not materialized. Experiments with the initiative, referendum and recall have not met expectations.

The rise, the tryout and the fall of commission form of government in Denver present many interesting features, as well as a most instructive lesson in self-government. It illustrates most forcibly how the best intentioned people, through personal sacrifice of a high order, may contribute to confusion and bad government and leave behind as the sum of their public service only an illustration of the utter futility of their proposed reforms. Bob Spear, the alleged corruptionist, was charged with all kinds of political wrongs, and his first administration made the special argument to show the necessity of reform. Through the vicissitudes of popular initiative, referendum and recall, a hydra-headed commission form of government was created, embodying many of the reforms demanded. The entire failure of the system brought the people back to the Hon. Robert W. Spear, recently deceased mayor of Denver, who was elected by an almost unanimous vote upon a charter prepared and initiated by himself, giving to himself almost autocratic power. At his death, after ten years of executive control, he left a personally selected successor and commanded the almost universal adulation of the people as a model of efficiency and the best mayor Denver ever had.

After years of turmoil, Denver returned almost to the point of starting, not perhaps to perfect government, but the best government which is possible under present conditions.

THE FUTURE OF RAILROAD CONTROL

Transportation is a fundamental requirement of commerce. Nothing is of practical value until it is removed from the point of its origin. The coal which furnishes our power, the iron from which our machinery is constructed, the gold which measures our values, each is valueless until removed from the point of its origin. In the early days all cities of importance were built at the water's front, where the facilities of water transportation were available. Even in these days of railroads, which carry the great bulk of our freight, nearly all large cities are located at the water's edge, because of this additional facility to the means of removing articles of commerce from one point to another. Railroad facilities have been an essential factor in the industrial development of the United States. Immense fortunes have been made in the construction of competing railroad lines; vastly greater fortunes have been made because of the greater facilities furnished business enterprises. The United States during the past has enjoyed transportation facilities far excelling those of any other country of the world. The compact countries of Europe have not enjoyed a service as frequent or as expeditious as have remote sections of the United States. It is true that many unjust conditions have been created by the private management of railroads, but it is true that far outweighing those conditions which grew up under private management of the railroads were the cheap rates, the luxurious passenger accommodations, and the rapid and effective carrying of freight. Notwithstanding the wonderfully perfect facilities which this country enjoyed, the constant clamor for perfection in railroad service and the desire to relieve the system of its handicap led to the creation of the Interstate Commerce Commission and a control of railroads which, notwithstanding the increasing traffic, makes extremely difficult the maintenance of the increased equipment, the enlarged terminals and all of those increasing facilities required to keep the service up to the highest standard. When the war broke out, the Government heedlessly located all of its extraordinary industries at the points of the greatest railway congestion, the fuel administration interfered with the delivery of coal during the open season, and the increasing demands upon the railroads were in excess of their capacity. Had the seizure of the railroads by the Government been made by those who were not suspected of a desire for continued government control, little, if any, criticism would have been made against the assumption by the administration of the control of the railroads. During previous years the railroads had asked for an increase of 5 per cent in freight rates, had insisted that this increase was in order that their facilities should be kept up to the required standard. The plea was made the target for unlimited abuse and vilification of railroad men, and a special argument in favor of government ownership of railroads. Under government control, an increase of 25 per cent in freight rates was ordered without hesitancy to meet the cost of transportation, and almost a 50 per cent increase of passenger rates, coupled with an exasperating inconvenience of public travel. Notwithstanding these increased charges for public service, the railroads, which made some profit at the lower rate and with decreased business, are losing money with the higher rates, the increased traffic and the poorer service. It would seem that these conditions would effectually and entirely put an end to any public clamor for continued governmental control. The fact that this question is being seriously considered by congressional committees, justifies the belief that there are some people who have not yet had enough. The mining industry pays approximately 60 per cent of the total freight paid to the railroads of the United States.

This stupendous sum is only part of the tribute which the mining industry is paying for the luxury of governmental management of railroads. THE MINING CONGRESS JOURNAL is anxious to discover

the attitude of its readers upon this great public question, and it asks that its readers will make response to the following questions:

Do you favor the permanent management and ownership of the transportation facilities of the United States by the Federal Government? If not, do you favor private management of railroads under competitive conditions subject to governmental supervision?

THE MINING CONGRESS JOURNAL would like to have these questions answered, not so much upon preconceived notions as to the advantage or disadvantage of government ownership, but more as a reply to the inquiry as to whether the railroad facilities under governmental management are to be preferred to the service offered during the pre-war period.

WAR MINERALS RELIEF

S. 5234 introduced by Senator Henderson, and H. B. 13498 introduced by Congressman Foster, chairmen, respectively, of the Senate and House Committees on Mines and Mining, provide for the relief of those who at the earnest solicitation of government representatives made investment in mining enterprises which gave no promise of permanency, to provide special minerals absolutely essential to the conduct of the war, the supply of which had been cut off by taking the ships engaged in importations from Brazil, New Caledonia, Spain and other countries to carry soldiers and their munitions and supplies to France.

National pride cannot be enhanced by any course other than that which would be accorded by a fair business house to those who, under similar circumstances, had incurred liabilities. What would be said of the United States Steel Corporation if, at a time of a great peril to its property which some unusual and immediate service was required to protect, its board of directors being unable to act because of sickness or absence, the management asked the citizens of the neighborhood to incur unusual expense to protect its property, should it repudiate the obligation thus incurred by those who assisted, because no contract had been authorized by its board of directors?

What would be said of the Standard Oil Company, if the digging of a protecting trench was absolutely necessary to protect its oil storage tanks from an oncoming conflagration, it should refuse to pay the cost of digging the trench because no valid contract had been made for the service. These corporations have been denounced as soulless and heartless and yet no one, for a moment, would expect from them any disposition of a claim for such service but fair compensatory settlement.

Surely this great American Republic will not be less honorable. Surely "My Country" will settle this question in a broad, liberal, fair spirit and demonstrate that it does not "stand upon the bond."

LABOR, INVENTION AND CAPITAL

To insist that prices may come down while wages increase is to detract from the importance and the dignity of labor. Prices are made up of materials and service. Approximately 70 per cent of retail prices is made up of the charge for service, the service of invention, of organization and management, and of labor. Capital by common consent is entitled to earn 4 per cent where there is no risk, 6 per cent where the minimum of risk prevails, and an additional return to cover increase risk inherent in a hazardous business venture. It is generally conceded that a mining investment, because of the wasting nature of its assets, must pay 15 per cent to give its stock a par value. This applies to an established mining enterprise with measured bodies of mineral fully developed.

The developing enterprise usually known as a prospect must promise a much larger return, for it must provide for the risk of non-discovery and of disappointing richness and size of mineral bodies.

The earning of capital is fairly well established and definite. The value of the service of organization and management is more difficult to establish. This earning usually accrues to the consumer as a result of a lower price.

The organization which increases production or decreases selling and distribution costs by wholesale operations, usually lowers prices in order to extend its market so as to absorb its increased production.

This to an extent applies to the service of invention, which is perhaps the most potent force in bringing luxuries within the reach of thrifty people. The invention which enables one man to do as much work as ten men can do without its use is fairly entitled to a share of the increased earnings of the man and the invention.

To properly establish the value of that share is not an easy problem. Its determination must, ordinarily, be established by the law of supply and demand.

To sum up the earning power of capital is fairly well established. The earning powers of organization and management and of invention are variable, being largely determined by the law of supply and demand. Having provided the proper minimum earning of capital, of organization and management and of invention, all of the remaining earnings of productive power should go to labor as its proper share, providing that labor carries its share of the hazards of production.

The wage system is a device by which the reward of labor is made uniform and as continuous as the law of supply and demand will permit, while relieving labor from the risks of the involved business. Partnership of labor and capital embodies the correct principle, but labor is unwilling to share the losses. The partnership idea embodies a sharing of both losses and profits.

No matter what the system, the fact remains that a very large part of the price paid consists of the cost of the labor involved in the production, the distribution and the exchange, all of which must be paid by the consumer. Wages may be high as measured by the day or week, but they must be low as measured by output before prices can be reduced. To say else is to detract from the importance of labor to the industrial progress and welfare of the nation.

THE WAR MINERALS DIVISION ASKS CONGRESSIONAL RELIEF

The mining fraternity generally is aware of the main facts as to losses now facing the producers of war minerals. There were several contributing causes, the principal being the sudden cessation of hostilities in Europe and the failure of the administration to make the War Minerals Bill immediately effective. The conditions under which hundreds of men of small working capital were led into investments which now threaten to prove their financial ruin were such that even administration officials openly admit moral responsibility for the distress. The American Mining Congress issued a general call for the assembling together of the producers of chromite, manganese, pyrites, tungsten, and magnesite in Washington on December 16 for the purpose of discussing frankly, at an open meeting, the problems confronting the producers in order that some concrete plan might be brought out of the many suggestions offered.

More than fifty operators, representing about 1,200 properties, attended all of the sessions of the Congress, which lasted throughout Monday and Tuesday, December 16 and 17. Some of the statements made to the conference brought tears to the eyes of the auditors, and there were several dramatic moments when men, who were facing financial disaster, stated their cases in plain English. One very interesting and significant fact was the attendance at practically all of the sessions of several members of both House and Senate, and several government officials, among them Director Manning of the Bureau of Mines, were present at all conferences.

At the Tuesday morning session there occurrd another significant and interesting incident when James Lord, chairman of the mining committee of the Department of Labor War Board and president of the mining department of the American Federation of Labor, appeared as the personal representative of Mr. Gompers and addressed the convention in very frank terms, stating his views as favorable to relief legislation in behalf of the operators now in distress. Mr. Lord advised the operators present that the major troubles of mining operators are the result of lack of organization and unity of effort. He drew a dramatic picture in comparing the unity of the Laborites with the disorganized condition of the producers. Mr. Lord's talk was one of the most impressive and valuable of the entire conference as giving in exact language the reason for the confidence of the American Federation of Labor in its own prowess and as placing that organization side by side with the producers' organization in seeking justice for the men whose fortunes are now at stake.

Another interesting feature of the conference was the unanimity of spirit between the operators, it being agreed that personal opinions and desires must be set aside and the strength of the Congress expended in an effort to secure the form of relief which seemed most reasonable and advisable, regardless of whether or not the measure proposed should provide full relief for all operators. The conference, of its own volition, requested it be accepted into the American Mining Congress as a national division of the work, to be known as the War Minerals Division. It organized its own machinery by the election of an executive committee with a permanent chairman and secretary. It also proceeded to make its proposed campaign for relief an effective one through properly financing itself before the delegates left for home.

Secretary Lane was constantly in touch with the work of the conference, and twice during its sessions conferred with committees appointed by the conference to talk over with the secretary the viewpoint held by that official. Chairman Henderson of the Senate Committee on Mines and Mining, Chairman Foster of the House Committee and several other members of both House and Senate addressed the conference briefly, stating their belief that there should be some form of relief afforded without delay.

Immediately following the closing of the main sessions, the majority of the members of the executive committee, most of whom reside a great distance from Washington, went into executive session to consider the various suggestions made during the conference, and after five days of continuous consultation between themselves and leaders and officials of the Administration, prepared a bill which appears in full in another column of this issue of the JOURNAL. This bill was promptly presented in both House and Senate by the chairmen of the two Committees on Mines and Mining, and by Congressmen Oldfield of Arkansas and Welling of Utah in behalf of their constituents.

The future of this relief movement rests partly in the hands of the operators themselves, and it is hoped that no stone will be left unturned to prevent what would be no less than a national calamity that would, for a term of years, slow down the movement for the development of domestic production of the minerals now generally recognized as absolutely necessary to national security.

FIRST NATIONAL DIVISION NOW BEING ORGANIZED

The conference of mineral producers, called in Washington to discuss the post-war problems, paid a high compliment to the American Mining Congress in adopting the following resolution:

> Whereas, We recognize the value of united action on the part of the producers of raw materials and the necessity for cooperation between all branches of the mining industry in the United States; and
>
> Whereas, The American Mining Congress has already established an unquestionable standing in the national capital as the representative of the majority of

the producers of minerals and metals; and

Whereas, The American Mining Congress has already given considerable time to the interest of the producers of metals and minerals listed in the War Minerals Bill as being necessary to the economic development of the United States, such organization having called together the producers of manganese, chrome, tungsten, pyrites and magnesite in this conference for the purpose of securing concrete expression of the requirements of all these producers in connection with making the War Minerals Bill operative or securing some other form of relief; be it hereby

Resolved, That the War Minerals Division of the American Mining Congress, as organized by this conference, does hereby call upon all producers of war minerals to affiliate with the American Mining Congress and to cooperate with the War Minerals Division.

Resolved, further, That the executive committee is herewith instructed to forward a copy of this resolution, together with a special appeal, to all producers interested in this subject.

The War Minerals Division, thus created, includes in its membership all of the metals and minerals named in the War Minerals Bill as necessary to national security in time of war. Many of these substances are of vast importance in establishing upon a firmer basis the steel and other like industries of the country. This division at once, and very naturally, assumes a most important work in behalf of national development and should have the open endorsement, through membership and support, of every man and corporation interested in the production of these minerals and in the national welfare. The selection of the first executive committee of this conference was made from among the operators present at the conference, because of the fact that these producers assembled as a purely business proposition to fight for their rights in connection with the imminent disaster. The conference, however, adopted a subsequent resolution, as follows:

Whereas, The War Minerals Division of the American Mining Congress has been organized by the producers of manganese, tungsten, pyrites, chromite and magnesite, called in conference by the American Mining Congress, in behalf of the minerals and metals named in the War Minerals Bill; be it hereby

Resolved, That the executive committee is hereby authorized to add to its membership representatives of minerals other than those represented on the floor of this conference, as in its discretion seems to be advisable, or to fill vacancies in its membership as may, from time to time, be deemed necessary, or to approve temporary substitutes.

The executive committee, we understand, is now making an effort to find from among the leaders of the producers of other minerals and metals included, men who are willing to devote their time to the good of the industry and who can be named by the executive committee in order to complete the machinery of that organization.

Mr. A. J. Edwards, who was selected as the permanent chairman, is heavily interested in manganese production in the Batesville district. He is also a practicing attorney in Los Angeles and Chicago. The chairman has promised to devote all of his time to the direction of the campaign which will be carried on for relief. Chairman Edwards will be ably seconded by Vice-Chairman Weirum, a producer of magnesite in Washington, and who has agreed to remain in the national capital until the fight is ended. The War Minerals Division has already established headquarters with the American Mining Congress, and its executive staff is working at high speed to carry out the plans of the conference. This is one of the most carefully and thoroughly organized efforts ever made by mining men in their own behalf, and will, THE MINING CONGRESS JOURNAL hopes, prove to be the beginning of a new era in organized effort on behalf of the greatest basic industry in the United States.

Exportation of Tin and Tinplate

The War Trade Board announce that the restrictions hitherto existing on the exportation of tin and tinplate have been removed, as the necessity for strict conservation of tin and its products no longer exists. If, therefore, applicants will refile applications for which licenses have been hitherto refused, these will be given immediate consideration.

DIRECTORS' ANNUAL MEETING

Most Prosperous Year in the History of Mining Congress

With its greatest year of accomplishment drawing to a close, the annual meeting of The American Mining Congress, which was held in New York City, December 10 and 11, assumed unusual interest and importance.

There were in attendance members of the Congress, representing every branch of the mining industry. Keen interest was evidenced in the discussions resulting from the questionnaire which had been previously sent to all members, showing that representatives of the mining fraternity present realized the seriousness of the problems concerning the industry and the very great necessity of working out some plan whereby all conditions might be stabilized as quickly as possible and by the combined help of operator and employe.

Secretary Callbreath read a number of the most interesting and significant replies sent in by members, one dominant note throughout the correspondence indicating a very general belief that every phase of production cost must be reduced, and that any attempt to readjust conditions—except it be done on a general level—of elements moving unitedly toward the general result might create distress both commercially and politically.

JOHN C. HOWARD
Newly elected director of The American Mining Congress

The report of the accomplishments of The American Mining Congress during the period of the war showed such progress in the increase in strength and results that President Douglas, in an enthusiastic address, complimented the Congress and the Directors for the splendid accomplishments of the year, and stated that he believed it was time that The American Mining Congress was placed upon a more practical footing and in a position of greater power as the official representative of the mining fraternity.

In talking over the work of the Mining Congress, President Douglas expressed the belief that it could perform an invaluable national service by urging the establishment of a Department of Mines, with its head a member of the President's Cabinet. He brought out very clearly the peculiar conditions under which the Bureau of Mines was forced to act in behalf of mining while merely a part of a general division of the national administration, and believed that mines and mining, collectively the most important industry in the United States, had a right to direct representation in the councils of the national administration.

He discussed favorably a plan submitted by Secretary Callbreath for the development of a Bureau of Mining Economics and the maintenance in Washington of a permanent cabinet of specialists, devoting full time to working out the problems of the various phases of the industry.

Directors Wells and Day also discussed quite at length the proposals of the secretary for the establishment of the enlarged effort, and both were favorable to assuming the increased labor as fast as financial resources seemed available.

John C. Howard, of Utah, said: "I have been a member of the organization only a short time, but sufficiently long to be convinced of its usefulness. We all realize that the day is here when we must present our claims to Congress and the Administration through properly accredited and thoroughly organized channels. My experience proves that Congress welcomes information concerning the issues at hand. Often laws are enacted without committees being properly informed, and probably one of the greatest functions of The American Mining Congress is that of enlightenment. It will require a long time to finance the organization on the basis proposed by the secretary, but I believe that we should begin, and I am in favor of the plan being put into effect in a moderate way,

so that we will not burden ourselves too heavily."

Some discussion was raised by the proposal of Secretary Callbreath to establish a Department of Industrial Welfare, a fear being expressed by some present that it would lead the Congress into participation in labor disputes, while others agreed that a Department of Welfare, devoting its energy to physical, mental and spiritual uplift of operatives and their families, would be a valuable work for the Congress to assume.

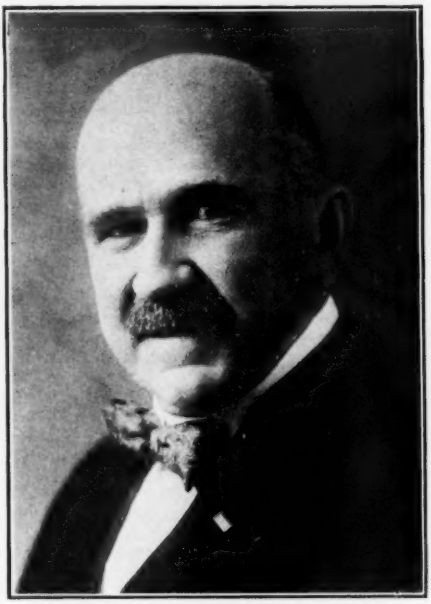
Mr. Howard and others favored better housing for the Mining Congress in Washington, and believed that greater efficiency would follow the enlargement of housing facilities at a very early date.

An auditing committee, appointed by President Douglas, consisting of Messrs. Bulkley Wells, of Colorado; John C. Howard, of Utah, and A. C. Morrison, of New York, reported favorably upon the acceptance of the financial report of the secretary.

President Douglas appointed Messrs. John T. Barnett, of Colorado; Henry Mace Payne, of New York, and J. C. McCutchem, of Pittsburgh, as a nominating committee, and on the report of this committee the following directors were elected:

For one year—John C. Howard, Salt Lake City, Utah. For three years—Bulkeley Wells, Denver, Colo.; Harry L. Day, Wallace, Idaho; E. L. Doheney, Los Angeles, Cal.; E. P. Mathewson, New York City.

E. L. DOHENY.
Another of the new directors of The American Mining Congress.



E. P. MATHEWSON.
Elected a Director of The American Mining Congress at the New York meeting.

On motion of Mr. Wells, the following resolution was adopted:

"Resolved, That The American Mining Congress accept as a general program the reorganization and development plan submitted by the secretary, the actual adoption of this plan to be effective only in the discretion and by order of the directors, and then only as the assured income of the Congress will cover the increased expenses so to be incurred."

A special financial committee, of which Mr. Wells was chairman, reported in favor of adopting the following plan of financing the Bureau of Mining Economics under control of the Mining Congress:

Ten cents assessment per $1,000 of gross production.

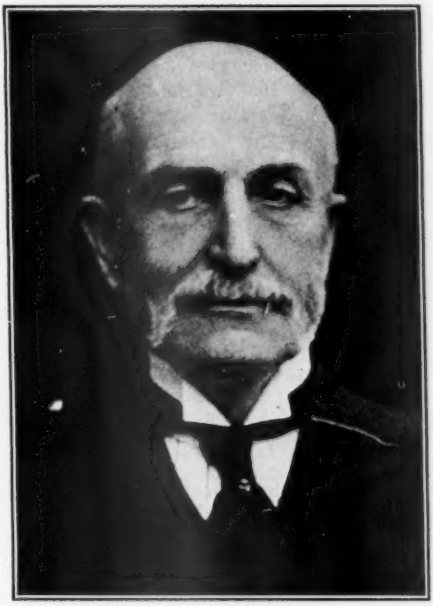
A minimum subscription of $60 per year ($5 per month). A maximum subscription of $6,000 per year ($500 per month) per corporation.

After brief discussion, the report of the finance committee was adopted and the secretary authorized to enter into contracts for the establishment of the bureau and other new features of the work as proposed.

ORGANIZATION OF DIRECTORS

The newly elected Board of Directors met in the members' room of the American Institute of Mining Engineers immediately following the closing of the open conference of directors with members.

There were present the following directors:



M. S. KEMMERER.
Re-elected Vice-President of The American Mining Congress, at the New York meeting.

Walter Douglas, Bulkeley Wells, Harry L. Day, John C. Howard, George H. Crosby, E. P. Mathewson, M. S. Kemmerer.

The following officers were elected by unanimous vote:

President—Bulkeley Wells.
First Vice-President—Harry L. Day.
Second Vice-President—M. S. Kemmerer.
Third Vice-President—George H. Crosby.
James F. Callbreath was reelected secretary.

Messrs. Wells, Kemmerer and Mathewson were designated as the Executive Committee.

A vote of thanks and appreciation was extended to Mr. Douglas, who, through two years of its presidency, had shown a deep personal interest in the work of the Congress, and to whose unselfish and effective cooperation was due in a large degree the development of the Congress' work.

A resolution was adopted expressing the appreciation by the directors of the work of Mr. Callbreath as secretary of the organization during a long term of years.

FINANCIAL REPORT

The financial report showed that $36,000 was expended by the organization for its work during the year.

The subscriptions from the various branches of the industry, including membership dues received, were approximately as follows:

Copper	25%
Lead and zinc	15%
Iron and steel	2%
Oil	17%
Gold and rare metals	26%
Coal	15%

The subscriptions from memberships received during the year represented Alaska, Alabama, Arkansas, California, Canada, Colorado, District of Columbia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Massachusetts, Minnesota, Missouri, Montana, Nevada, New Mexico, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, Wyoming.

The report also showed the following state organizations having contributed from $500 to $3,000 each:

Arizona Chapter, American Mining Congress.
California Metal Producers' Association.
Colorado Chapter, American Mining Congress.
Idaho Metal and Mining Association.
Illinois Bituminous Coal Operators' Association.
Indiana Bituminous Coal Operators' Association.
Mid-Continent Oil and Gas Association.
Mine Operators of Montana.
Southwestern Coal Operators' Association.
Utah Chapter, American Mining Congress.

GEORGE H. CROSBY.
Re-elected Vice-President of The American Mining Congress, at the New York meeting.

GOLD PRODUCTION SHOWS $15,257,200 DECREASE IN 1918

The Bureau of the Mint and the Geological Survey have issued the following joint statement as to the preliminary estimate of the production of gold and silver in the United States during the calendar year 1918:

State or territory	Gold		Silver
	Fine ounces	Value	Fine ounces & value (*)
Alaska	440,622	$9,108,500	796,836
Alabama	36	700	2
Arizona	278,647	5,760,200	6,771,490
California	832,389	17,207,000	1,555,417
Colorado	621,791	12,853,500	6,982,313
Georgia	169	3,500	41
Idaho	30,764	636,000	10,188,056
Illinois	—	—	8,939
Maryland	—	—	164
Michigan	—	—	491,939
Missouri	10	200	40,948
Montana	153,375	3,170,600	15,341,793
Nevada	322,276	6,662,000	10,113,405
New Mexico	30,871	638,200	763,758
North Carolina	38	800	9
Oregon	60,951	1,260,000	150,207
Philippine Islands	44,202	913,700	12,597
South Dakota	328,305	6,786,700	165,865
Tennessee	263	5,400	131,931
Texas	5	100	612,436
Utah	152,018	3,142,500	13,439,811
Vermont	47	800	5,117
Virginia	20	400	2,967
Washington	16,556	342,300	302,446
Wyoming	18	400	719
Total	3,313,373	$68,493,500	67,879,206

Compared with the 1917 production: Gold, $83,750,700, and silver, 71,740,362 ounces. These figures indicate reduction in gold output of $15,257,200, and in silver output, 3,861,156 ounces. The 1918 gold output is the smallest in twenty years, and the silver output is the smallest since 1913.

* Valued at the Government buying price of $1 per ounce.

Loving Cup for Mark L. Requa

The personnel of the oil division of the United States Fuel Administration has presented Mark L. Requa, general director of the division, with a silver loving cup. The presentation speech was made by Frank J. Silsbee, director of the Statistical Bureau.

Mr. Requa, in accepting the cup, thanked his co-workers for their steadfast cooperation and close attention to their duties during his directorship.

Import Restrictions on Asbestos Lifted

The War Trade Board announces that List of Restricted Imports No. 1 has been amended by the removal of Item 4, Asbestos. Applications for import licenses for ocean shipments of asbestos will therefore now be considered.

It is also announced that the requirement of indorsement of bills of lading to the Asbestos Trades Bureau will be waived as to licenses hereafter issued.

AMERICAN MINES MAKE MAGNIFICENT SHOWING

Production in 1917 and 1918 Exceeds $10,000,000,000 — Metallic and Non-Metallic Yields Show Big Gains.

The magnificent record of over $10,000,000,000 in mineral output by the United States for the last two years is indicated by preliminary estimates of the United States Geological Survey, Department of the Interior, for 1918, combined with known final figures for 1917.

These estimates show that the output of metallic products, chief of which are pig iron, copper, ferro-alloys, lead, zinc, gold, silver, and aluminum, was valued at over $1,895,000,000 in 1918, against $2,091,825,000 in 1917, and that the non-metallic products, principal of which are coal, petroleum, clay products, cement, and natural gas, were valued at over $3,265,000,000 in 1918, against about $2,889,000,000 in 1917.

The total for 1918, including unspecified products, is roughly estimated by the Survey at $5,160,000,000, a good increase over the total of nearly $5,011,000,000 for 1917, and a vast increase over $3,513,972,000 for 1916.

Meso-thorium a Substitute for Radium

The increasing demand for radium for medical work, but more particularly for luminous paint, has made the question of possible radium substitutes of considerable importance. Radium luminous paint has been used in the war for a number of purposes, more particularly on the dials of instruments used on airplanes, so that these instruments can be read at night; for electric push buttons, door numbers and small images for shrines, etc. The paint is permanently luminous in the dark, and contains from 0.1 to 0.25 milligrams radium element to 1 gram of zinc sulphide. A luminous watch face usually has from 10 cents to 20 cents of radium on it.

An excellent substitute for radium for certain purposes is meso-thorium. This is a radio-active element found in monazite sand and other thorium minerals. When first extracted it is not in a satisfactory condition for luminous paint, but must be allowed to "ripen" for several months, or even a year, before it can be used. During this time the Alpha radiation which is required for luminous paint becomes sufficiently strong. On the other hand, the beta and gamma radiation of meso-thorium grows rapidly, and it can be used for medical purposes within a few days after preparation.

ARIZONA INCREASES YIELD OF COPPER AND OF GOLD IN 1918

The output of gold, silver, copper, lead, and zinc from Arizona mines in 1918, according to the estimate of Victor C. Heikes, of the United States Geological Survey, Department of the Interior, had a total value of about $205,500,000, an increase of $3,800,000. There were decided increases in both the copper and the gold of Arizona during the year. The silver output was very close to the production of 1917, but the lead was only half as much, and the zinc fell to a very small production. Arizona was fortunate in being practically free from strikes, and all the smelting plants were active throughout the year.

The production of gold from Arizona mines increased from $5,068,193 in 1917 to about $5,551,000 in 1910. This was an increase of nearly $500,000 in spite of the increase in the cost of supplies and the difficulties in procuring men for labor. A large part of the gold was obtained from the smelting of copper ores, the tonnage of which was increased markedly during the year, but nearly half of Arizona's total gold output was due to the cyanidation of gold ores in the San Francisco district, of Mohave County, known as the Oatman region. The United Eastern remained by far the largest gold producer of the state, and the Tom Reed continued to supply notable gold output. The Gold Road mine was not productive, and the output of the Copper Chief in Verde district was much less.

The mine output of silver decreased slightly, from 6,983,913 ounces in 1917 to about 6,787,000 ounces in 1918. On account of the increase in the price of silver, the value of the output increased from $5,754,744 to about $6,569,000. It is probable that the slight decrease in quantity resulted from a decrease in shipments of lead ore, which contains considerable silver. The increase in the copper output came partly from ores which contain little or no silver, such as the New Cornolia, at Ajo.

The mine output of copper increased from 712,166,891 pounds in 1917 to nearly 777,000,000 in 1918. In spite of this increase of nearly 65,000,000 pounds in quantity, the value of the output decreased from $194,421,561 in 1917 to a little over $192,000,000 in 1918, as the average price of copper decreased from 27.3 cents to about 24.75 cents a pound. Aside from the steady operation of the copper plants of Arizona, two of the main features which contributed to the larger copper production were the blowing in of the new copper smelter of the United Verde Extension Co. at Verde near Jerome, and the continuous operation of the leaching plant of the New Cornelia at Ajo. Another decided increase resulted from the International plant at Miami, which treats concentrate from the Inspiration property. In Greenlee County the plants of the Shannon, Arizona Copper, and Detroit returned to normal outputs after the strikes of 1917.

The mine production of lead in Arizona decreased from 23,465,445 pounds in 1917 to less than 13,000,000 pounds in 1918. The value of the output decreased from $2,018,028 to about $985,000. One of the main reasons for the decrease in lead as well as in zinc, was the idleness of the Tennessee mine, in Mehave County. As there were very few shipments of zinc ore or lead-zinc ore, the lead from residues was considerably less. Most of the lead came from the Copper Queen and Shattuck Arizona properties in Cochise County.

The output of recoverable zinc decreased from 20,894,860 pounds in 1917 to about 1,800,000 pounds in 1918. The value decreased from over $2,000,000 to about $151,000. The Golconda mine, in the Wallapai district, Mehave County, formerly a large producer, was closed, and the Tennessee mine, which produced lead-zinc milling ore, was practically worked out and sold to the Schuylkill Mining Co., which owns adjoining ground. Considerable zinc shipments came from the Duquesne property in Santa Cruz County, and from the Hillside property, in Yavapai County.

Dividends from Arizona mining companies during the first eleven months of 1918 amounted to $35,003,683, exclusive of those of the Phelps Dodge Corporation, which also operates mines in Mexico and New Mexico. The total, including those of the Phelps Dodge Corporation, was nearly $45,000,000. The companies paying dividends were the Miami, Arizona Commercial, Inspiration, Iron Cap, Shattuck, United Eastern, United Verde, United Verde Extension, Arizona Copper, Calumet & Arizona, Consolidated Arizona Smelting, Magna, Old Dominion, Ray Consolidated, New Cornelia, and Phelps Dodge.

COLORADO'S METAL OUTPUT SHOWS FALLING OFF IN 1918

The mine output of gold, silver, copper, lead and zinc in Colorado for the first eleven months of 1918 and the estimated output for December, according to data compiled by Charles W. Henderson, of the United States Geological Survey, Department of the Interior, amounted to $12,950,000 in gold, 7,120,000 ounces of silver, 64,300,000 pounds of lead, 6,450,000 pounds of copper, and 85,200,000 pounds of zinc, having a total value of $33,260,000, compared with $15,849,302 in gold, 7,304,350 ounces of silver, 67,990,000 pounds of lead, 8,122,000 pounds of copper, and 118,200,000 pounds of zinc, having a total value of $41 988,935, in 1917. This

estimate shows a decrease of $2,900,000 in gold, 184,000 ounces in silver, 3,690,000 pounds in lead, 1,660,000 pounds in copper, and 38,500,000 pounds in zinc. At the increased price for silver the value of the silver yield was $880,000 greater than in 1917, but the value of copper decreased $624,000, lead $1,025,000, and zinc $9,520,000.

The decrease in gold showed in both bullion products and in ore and concentrates marketed directly to lead plants, but there was an increase of silver contents in ore marketed direct from the mines, the decrease in silver and lead being due to a decrease in lead concentrates from lead-zinc ores.

The five lead-copper plants at Salida, Globe, Pueblo, Durango and Leadville were operated steadily, with an actual increase in tonnage from Colorado mines, but a decrease in tonnage from outside states, particularly in zinc residues. The United States Zinc Company's magnetic wet-concentration mill and smelter at Pueblo, treating lead-zinc sulphide ores from the western states, was not as actively operated as in 1917. The River Smelting and Refining Company's plant at Florence continued to treat low-grade zinc-lead copper ores from Colorado and other western states. The Western zinc-oxide plant at Leadville was steadily operated on Leadville zinc carbonate ores, and the new Ohio zinc-oxide plant at Florence, which started in June, 1918, operated on Colorado zinc carbonate ores. The Empire Zinc Company's magnetic separation mill at Canon City was operated steadily on Red Cliff and Leadville zinc sulphide ores, but the Western Chemical Company's magnetic separation wet-concentration mill, treating similar ores, was idle part of the year. Copper ore and matte and cyanide precipitates were shipped from Colorado to the smelter at Omaha, and some copper and lead ores were shipped to plants in Utah. The tonnage of zinc ores sent to Kansas, Oklahoma, and eastern states zinc oxide and spelter plants decreased heavily. Much silver-bearing pyrite was used for the manufacture of sulphuric acid up to the date of the armistice, and some pyrite went to the east and south. Considerable manganese ore, chiefly from Leadville, was shipped to Pueblo and to far eastern plants.

As predicted in the Survey's six months' review, issued in July, the production of Cripple Creek fell from $10,394,847 in 1917 to $8,294,000 in 1918, a decrease for the year of $2,100,000. The Portland Colorado Springs cyanidation mill was closed in April, and the ores that had been going to that mill were sent to the Golden Cycle, at Colorado Springs, which has been operated continuously despite high costs of materials and labor and shortage of labor. In August the Portland Victor mill was closed, and the low-grade ores of the district were transferred to the Portland Independence mill, which has been operated steadily throughout the year. Ore direct to smelters, though small, still represented a tonnage not much smaller than in 1917.

Lake county, chiefly Leadville, but including also the Lackawanna Gulch, Sugar Loaf, St. Kevin, and Wortman lode districts and the Arkansas River dredge district, produced $879,000 in gold, 2,348,000 ounces of silver, 23,700,000 pounds of lead, 1,600,000 pounds of copper, and 44,600,000 pounds of zinc, having a total value of $9,000,000, compared with $1,160,180 in gold, 2,177,638 ounces of silver, 18,586,167 pounds of lead, 2,168,912 pounds of copper, and 60,000,000 pounds of zinc, with a total value of $11,265,077, in 1917. Manganese-iron ore, manganese-silver fluxing ore, lead carbonate, and zinc carbonate continued to be shipped from the Downtown district, which was unwatered in 1916. Considerable sulphide ores were shipped from the Fryer Hill district (also unwatered in 1916) until June, when the entire operation of this area under the management of the United States Smelting Company was abandoned. The year saw the close of the Moyer-Tucson mines of the Iron Silver Company, which had, however, purchased additional producing property. The cessation of pumping at the Moyer added to the water at the Cord winze of the Yak Company, so that with increased costs of mining and other difficulties this property was not producing to its usual standard.

In the San Juan region the situation as to labor, mining costs, and influenza was particularly arduous, but despite these difficulties San Juan County's production fell off only $60,000 in gold, 200,000 ounces of silver, 1,000,000 pounds of lead, and 600,000 pounds of copper and equalled the output of 1917 of 3,200,000 pounds of zinc. San Miguel County mills, treating ore from both San Miguel and Ouray counties, produced $2,180,000 in gold, an increased yield, 1,170,000 ounces of silver, 6,000,000 pounds of lead, 1,000,000 pounds of copper, and 400,000 pounds of zinc. The production of zinc for this country showed the only material decrease. Ouray County mines, as operated from the Ouray side, showed an increase for all metals, owing to work at Red Mountain and Sneffels. Development work was also continued at the Camp Bird mine, and the long low-level adit was completed during the year. If ore is found in quantities at depth in this mine, the Ouray County production should show a material increase for 1919. La Plata County mines were practically idle, the production being only nominal. Dolores County (Rico) yield showed small decreases for gold, silver, and copper and appreciable de-

creases for lead and zinc. Hinsdale County's production was the largest in years, owing to the reopening of the Ute and Ulay mines, which were, however, closed in the fall. Mineral County (Creede) showed decreases for all metals except silver, for which there was an increase of over 100 per cent. Saguache County mines were not active, the plans for construction of a mill by the Rawley Mining Co. having been abandoned.

Summit County's zinc production fell from 19,868,816 pounds of recoverable metal, valued at $2,026,519 in 1917, to 16,200,000 pounds, valued at $1,328,000 in 1918, and gold production from deep mines and dredges fell from $723,514 in 1917 to $473,000 in 1918. Eagle County mines were active under the management of the Empire Zinc Co.

Boulder County's yield of both gold and silver decreased very considerable; Clear Creek's gold yield decreased $100,000, silver 200,000 ounces, lead 1,000,000 pounds, copper 200,000 pounds, and zinc very appreciably. Despite the apparent idleness of most of the mines and the almost complete idleness of all mills in Gilpin County the yield was approximately 60 per cent of the production in 1917. Early in the year the long established Chamberlain sampling plants at Black Hawk and Georgetown were dismantled, and in October the Idaho Springs plant was closed, but another company remodeled one of the idle sampling plants at Idaho Springs and began receiving ores in November.

Chaffee County's production showed decreases for all metals except zinc, which had a small increase; and Pitkin County (Aspen) yielded 570,000 ounces of silver and 11,600,000 pounds of lead.

FURTHER MODIFICATIONS OF OIL CONTROL BY GOVERNMENT

The Fuel Administration has announced that, in line with the general policy of the Government of lifting all restrictions as rapidly as conditions would warrant, it has asked the oil industry to suspend its voluntary plan to stabilize prices and obtain uninterrupted flow of crude oil which was recently extended for a period of three months; and at the same time had taken similar action as to any voluntary understandings or agreements with respect to prices of crude oil or its refined products.

This suspension will be permanent unless events prove the necessity of again exercising control. The administration points out, however, that the licenses now outstanding will remain in full force and effect until the promulgation of peace, and that the rules and regulations as amended by the order of December 7 are still effective. All agreements will continue subject to cancellation or assignment on request of the United States Fuel Administrator.

The allocation of supplies of petroleum products for the Allies will terminate with the allocation for shipment during the month of January. The priority order with respect to export shipments of gasoline and kerosene will terminate with the allocation system. The allocation will continue to cover aviation gasoline and other supplies especially drawn from the interior for foreign account until these supplies are finally taken over by the Allies or until notice of discontinuance is issued by the Fuel Administration.

The order now outstanding regarding natural gas will remain unchanged, in its modified form.

By these various measures the Fuel Administration hopes to restore the oil industry to normal conditions with as little disturbance as possible; keeping in mind the fact that the authority for control still exists and will be exercised, should occasion require, pending the promulgation of final peace.

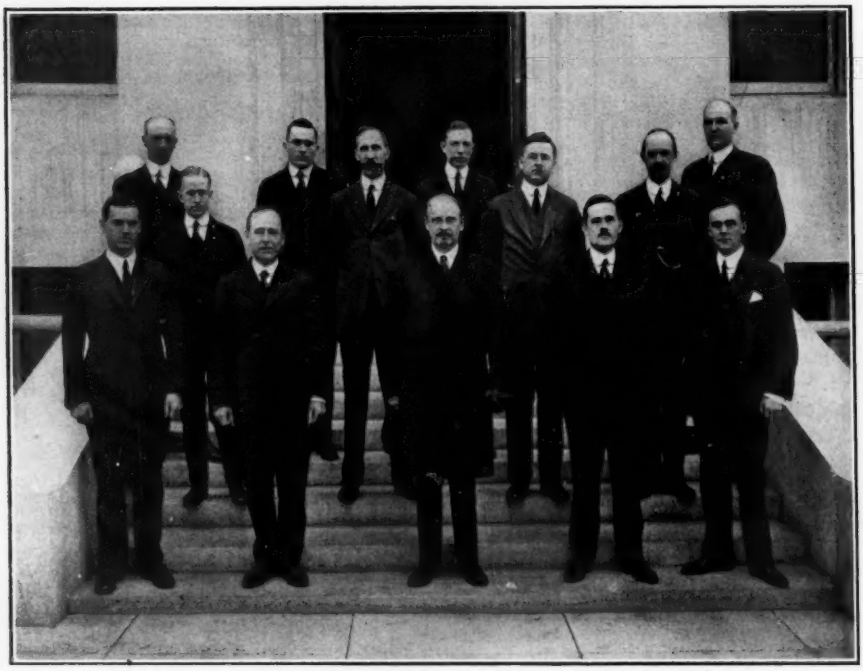
EXTENDED PERIOD NECESSARY TO REOPEN LENS COAL MINES

Damage done by the Germans to the coal mines at Lens, France, is so great that production cannot be resumed for periods ranging from eight months to three years, in the opinion of members of the special commission of the United States Fuel Administration as expressed in a cablegram received by Harry A. Garfield, United States Fuel Administrator.

The message, which was sent from Paris after an inspection of mines in the Lens region, states that the damage varies in degree; that production cannot be resumed for periods ranging from eight months to three years, and that plans for reconstruction are still under advisement.

The cablegram was signed by Walter E. Hope, who joined the Fuel Administration September 19, 1917, as Director of the Bureau of State Organizations. He, with S. Brinckerhoff Thorne, coal expert of New York, and James H. Allport, Engineer to the Fuel Administration, make up the commission which went to Europe late in October to inquire into conditions and government regulations affecting the coal industry in foreign countries.

Hennen Jennings, who has been spending several weeks in Florida, returned to Washington during the month, and is planning to leave early in January for an extended trip to California. Mr. Jennings has just completed his report on the gold situation for the Bureau of Mines.



WAR MINERALS STAFF OF BUREAU FO MINES

Left to right: A. G. White, W. C. Phalen, J. E. Spurr (Chief), H. C. Morris, C. M. Weld. Back row: V. T. McGuire J. C. Orchard, G. J. Salmon, A. W. Stockett. H. S. Madd, A. E. Wells, F. H. Probert and E. A. Luebler

WOULD SUBSTITUTE COKE, COAL OR OIL FOR NATURAL GAS

Wherever the supply of natural gas is declining at a rapid rate, the United States Fuel Administration is advocating the changing of appliances so as to make possible the substitution of either coke, coal or oil.

In the United States as a whole, the supply of natural gas is on the decline and in some sections, such as Ohio and Indiana, the situation is especially serious. In some places, especially in the Middle West, there has been extreme wastage, because of leakage from the pipes, and the Fuel Administration is urging all possible conservation of this natural fuel.

In winter, the demand for natural gas for domestic purposes goes up in exact proportion to the drop in the temperature and, as domestic consumers must be served first, the Fuel Administration is avoiding as far as possible the issuance of priorities to industries.

Texas Metal Mining in 1918

The Presidio silver mine in Texas was in continuous operation during the year 1918, according to Charles W. Henderson, of the United States Geological Survey, Department of the Interior. Desultory mining was also carried on in the Van Horn and Sierra Blanca districts, and several shipments of copper ore were made from deposits in the "Red Beds" of Foard and Knox counties. The result was a small output of copper and lead, and an output of silver of 590,000 ounces.

Diamond Control Ceases

The War Trade Board announced January 4 that the supervision heretofore exercised by the War Trade Board through the American Diamond Committee of New York over the importation of polished and rough diamonds, diamond dies, and diamond tools will be discontinued on January 10, 1919. The control of these commodities by license from the War Trade Board will still continue.

CONGRESSIONAL RELIEF ASKED FOR WAR MINERALS MEN

The following bill, prepared by the executive committee of the War Minerals Division of the American Mining Congress, was presented in the Senate December 23 by Hon. Charles B. Henderson, chairman of the Committee on Mines and Mining, United States Senate [S. B. 5234], and on the same day in the lower house by Dr. Martin D. Foster, chairman of the Committee on Mines and Mining [H. R. 13498], and Congressman William A. Oldfield, representative from Batesville, Ark. In both houses the bill was placed on second reading and ordered printed without delay. It is agreed by the chairmen of the committees that the bill will have early consideration in committee, and the War Minerals Division is hoping to secure final action before the adjournment of this session of Congress.

A BILL

To supplement an act of Congress, approved October 5, 1918 (public, numbered 220), and to authorize the Secretary of the Interior, from the funds appropriated by said act, to determine, adjust, and pay losses sustained by investments preparatory to production of war minerals mentioned in said act.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That the Secretary of the Interior be, and hereby is, authorized and directed to ascertain and determine the amount or amounts of money heretofore invested or contracted to be invested and obligations incurred by any and all persons and investors for producing or for the purpose of producing or preparing for producing or acquiring property for producing, within the United States, to supply the urgent, published, and evident needs of the nation during the war, any ores, metals, minerals, or mineral substances mentioned and enumerated in an act of Congress, approved October 5, 1918 (public, numbered 220), entitled, "An Act to provide further for the national security and defense by encouraging the production, conserving the supply, and controlling the distribution of those ores, metals, and minerals which have formerly been largely imported, or of which there is or may be an inadequate supply;" and that said Secretary ascertain, determine, adjust, liquidate, and out of the moneys provided and apropriated by said Act pay to the parties entitled thereto the amount of such losses and damages as he, the said Secretary, shall find and determine have been sustained and suffered or are likely to be sustained and suffered, by reason of having made such investments for said purposes or having produced surplus stocks of such materials; and that in each case he shall make such determination, provision, settlement, advancement, or final payment, and by agreement with owners and claimants make such other adjustment or take such other action as he shall find and determine to be just, equitable, reasonable, and expedient; and that he make such provisions as he may deem necessary, advisable, and reasonable to prevent further losses pending final decision, settlement, and disposition in any case or cases; that the payments herein authorized be made to the claimant or claimants the said Secretary shall find to be morally, equitably, and justly entitled thereto; that in ascertaining and determining the losses and damages sustained or to be sustained, and the adjustments, settlements, payments, and provisions to be made, the said secretary shall consider the prices and conditions existing at the time of each investment and the prices and conditions existing prior to the war, as well as those existing at the time of such determination, adjustment, and settlement, together with all of the circumstances and conditions of each case; that the final determination, decision, provision, disposition, and action of said Secretary in each case shall be conclusive and final; that all payments shall be made and all expenses incurred by the Secretary paid from the funds and appropriations provided and apropriated by said Act of October fifth, one thousand nine hundred and eighteen, (public, numbered 220), and that said funds and appropriations shall continue to be available for said purposes until such time as the said Secretary shall have fully exercised the authority hereby granted and performed and completed the duties hereby provided and imposed

SEC. 2. That a report of all operations under this Act, including receipts and disbursements, shall be made to Congress on or before the first Monday in December of each year.

SEC. 3. That nothing in this Act shall be construed to confer jurisdiction upon any court to entertain a suit against the United States.

RESOLUTIONS PASSED BY WAR MINERALS DIVISION

Among the resolutions adopted at the conference of the War Minerals Division of the American Mining Congress at Washington, December 16 and 17, were the following:

BUREAU OF MINES

Whereas, Under authority of Congress and by virtue of an urgent deficiency appropriation for war minerals investigations, approved March 28, 1918, the United States Bureau of Mines has been conducting investigations and research designed to promote development of domestic resources of the war minerals; and

Whereas, The said bureau has brought together a large mass of data and has under way investigations of large importance to this country; and

Whereas, This work is of even more im-

portance during the period of reconstruction than during the war; and

Whereas, Owing to the lack of funds, the investigations are about to be stopped while still incomplete; now, therefore, be it

Resolved, by this meeting: That Congress be urged to make at once an emergency appropriation of not less than $150,000 to continue the studies under way and to keep up to date the information regarding development of the war minerals and the needs of the mineral industry as an element in provision for the national security and welfare.

WAR MINERALS BILL

Whereas, On October 5, 1918, H. R. 11259, was approved by the President of the United States; and

Whereas, On November 11, 1918, the day on which the armistice was signed, the administration of this act, with the exception of power of imposing of duties, was turned over to the secretary of the Department of the Interior by the President of the United States, thereby indicating his intent to have the provisions of the act carried out; and

Whereas, Up to the present time none of the provisions of the act have been carried into effect; and

Whereas, American producers of the minerals specified therein, who were induced to invest large sums of money for the purpose of producing such minerals under the implied protection of the act, have suffered serious losses, and will continue to do so, and in many cases will be financially ruined by reason of the nonenforcement of said act; now, therefore, be it

Resolved, by this convention of the War Minerals Division of the American Mining Congress, held in the City of Washington, D. C., December 16 and 17, 1918; That the Congress of the United States be, and it is hereby, requested to take such legislative action at the present session as it may deem proper to insure the carrying out of the purpose and spirit of the aforesaid act in order that justice may be done.

LEAD AND ZINC PRODUCTION SHOWS DECREASE DURING 1918

The domestic mine output of lead and zinc decreased in 1918, according to C. E. Siebenthal, in a statement just issued by the United States Geological Survey, Department of the Interior. The lead and the recoverable zinc of ores mined was approximately 563,000 tons and 627,000 tons, as compared with 651,156 tons and 711,192 tons in 1917. The refined lead output of smelters and refineries was 645,000 tons, against 612,214 tons in 1917, and the antimonial lead output was 22,000 tons, as against 18,647 tons. The lead available in the United States is 540,000 tons, against 515,258 tons in 1917. The output of spelter from domestic and foreign ore was 525,600 tons, compared with 669,573 tons in 1917. Spelter from foreign ore decreased to 23,300 from 84,976 tons in 1917. The apparent domestic consumption of spelter was 440,000 tons, compared with 413,984 tons in 1917. The consumption figures of both lead and zinc include the metal shipped abroad for use of the American Expeditionary Forces. The average price of lead at New York was 7.6 cents a pound and of spelter at St. Louis 8 cents a pound.

Tells Coal Situation in France

An idea of the domestic coal situation in France is given by Capt. Joseph W. Breen, of the Gas and Flame Division of the American Expeditionary Forces, in a letter received by a member of the United States Fuel Administration. Captain Breen is a heating and ventilating engineer, and before entering the United States Army he was in business in Philadelphia. In the letter, he says:

"Coal here is $60 per ton and the regulations are very strict. The heating season is cut to three months. Hotels are allowed to furnish hot water for domestic purposes, two days a week only.

"It will be some time after the war before this conditon will change as the Germans ruined all the French mines. It will require years to get back to their normal output."

New Catalog

Catalog No. 244, just issued by the Jeffrey Mfg. Co. contains 40 pages devoted to details of Elevators selected out of numerous styles used in the handling of a wide range of materials in practically every industry of the country, and known as Jeffrey Standard Elevators.

A page is given to each Standard Elevator which is illustrated, both in perspective and in line drawing, giving dimensions. There is also an illustration showing the chain and bucket used in that type of elevator, and at the bottom of each sheet is given a full list of all specifications applying to that particular elevator.

The numerous examples and subjects which have been thoroughly outlined in this book, enable the prospective purchaser to readily select the proper standard elevator to meet his requirements, thus saving the time and expense heretofore required in making layouts and drawings for his own particular needs. The purchaser is further benefited by quick delivery, made possible by placing Jeffrey Standard Elevators upon a manufacturing basis.

The catalog is now ready for distribution.

THE
MINING CONGRESS
JOURNAL

PUBLISHED EACH MONTH BY
THE AMERICAN MINING CONGRESS,
Munsey Building, Washington, D. C.

Subscription Rate, per year..... $2.00
Single Copies..... .20

Entered as Second Class Matter January 30, 1915, at the Postoffice at Washington, D. C.

JANUARY, 1919

COPPER PRODUCTION INCREASED DURING YEAR JUST CLOSED

Montana Makes Big Gain Over 1917—Agrizona Output Larger—Alaska Shows Decided Decrease.

The production of copper in the United States in 1918 was slightly larger than in 1917, according to preliminary figures and estimates collected by B. S. Butler, of the United States Geographical Survey, Department of the Interior, from all plants that make blister copper from domestic ores or that produce refined copper. At an average price of about 24.75 cents a pound, the output for 1918 has a value of $473,000,000, as against values of $510,000,000 for 1917 and $190,000,000 for 1913.

The figures showing the smelter production from domestic ores represent the actual output of most of the companies for the first eleven months of the year and the estimated output for December. A few companies gave no figures for November, but furnished estimates of the combined output of November and December. The production of blister and Lake copper from domestic ores was 1,910,000,000 pounds in 1918, against 1,886,000,000 pounds in 1917 and 1,224,000,000 pounds in 1913.

The supply of refined copper (electrolytic, Lake, casting, and pig) from primary sources, domestic and foreign, for 1918 is estimated at 2,450,000,000 pounds, compared with 2,362,000,000 pounds for 1917 and 1,615,000,00 pounds for 1913.

According to the Bureau of Foreign and Dometsic Commerce, the imports of copper in all forms for the first eleven months of 1918 amounted to 535,868,000 pounds, against 556,000,000 pounds for the twelve months of 1917.

The exports of pigs, ingots, bars, plates, sheets, rods, wire, and like copper products for the first eleven months of 1918, as determined by the same bureau, amounted to 692,759,000 pounds; the exports for the twelve months of 1917 were 1,126,082,000 pounds.

At the beginning of 1918 about 114,000,000 pounds of refined copper was in stock in the United States. Adding this quantity to the refinery output of the year shows that the total available supply of refined copper was about 2,564,000,000 pounds. Subtracting from this total the exports for the first eleven months and the estimated exports for the last month, shows, on the assumption that there was no change in stocks, that the supply available for domestic consumption in 1918 was considerably more than the 1,316,000,000 pounds available in 1917.

Arizona produced about 777,000,000 pounds, compared with 712,000,000 pounds in 1917.

The mines of Montana produced 328,000,000 pounds, against 274,000,000 pounds in 1917.

Michigan produced 225,000,000 pounds, compared with 268,000,000 pounds produced in 1917.

Utah produced 233,000,000 pounds, compared with 245,000,000 pounds in 1917.

Nevada produced 105,000,000 pounds, compared with 122,000,000 pounds produced in 1917.

Alaska, with a production of about 69,000,000 pounds, showed a large decrease from the previous year.

New Mexico produced 98,000,000 pounds, compared with 105,000,000 pounds in 1917.

The production of California was considerably above the 48,000,000 pounds produced in 1917.

The production in Tennessee was about 14,500,000 pounds.

METAL PRODUCTION FALLS OFF 14 PER CENT IN CALIFORNIA

The metal mines of California made an output of gold, silver, copper, lead, and zinc valued at $32,223,500 in 1918, compared with $37,685,985 in 1917, according to preliminary figures compiled by Charles G. Yale, of the San Francisco office of the United States Geological Survey, Department of the Interior. This is a decrease of $5,462,500 or 14 per cent.

The mine output of gold for 1917 was $20,087,504. The estimate for 1918 indicates a yield of $17,242,400 in gold, a decrease of about $2,845,000. The deficit is, perhaps, less than had been expected in view of the war conditions, which had the effect of closing down entirely certain large producers and curtailing operations in others.

There has been a great scarcity of skilled labor in the mines of the state, and the operators have been compelled to employ older men and younger men than customary, with a resultant decrease in efficiency. Moreover, labor, supplies, power, powder, steel and other materials became so expensive that numbers of small mines had to close down altogether, and the larger ones curtailed operation. Again, owing to railroad restrictions, it was difficult and sometimes impossible to obtain necessary machinery within any reasonable time. The conditions existing during 1918 have affected the deep mines much more unfavorably than placer mining. The low grade of the ore in the greater mines of the mother lode section of the state compels strict economy at all times, and with steadily rising costs in all directions it became impossible for some of them to continue operations except at a loss. As a result, several mother lode companies discontinued producing operations and contented themselves with keeping the mines clear of water until conditions might change. Other companies reduced working forces, hung up part of their stamps, and virtually ceased their normal production. Some smaller mines throughout the state followed the lead of the larger corporations, but a great many of these ceased operations entirely for the time being. The cost of producing an ounce of gold, compared with what they received for it, became too great for them to continue. The deep mines of California, to which these statements refer, produce about 60 per cent of the gold of the state annually. The remainder of the gold is recovered by various forms of placer mining, the most productive of which is dredging. The gold-dredging industry of the state continues to be generally prosperous, although no new extensive fields have been discovered. Nevertheless some smaller fields, notably in the northwestern part of the state, are receiving more attention than formerly, and some new and very large dredges have been installed in reasonably large areas. The dredging industry has not been so materially affected by war conditions as the quartz-mining industry, but it has nevertheless been hampered to some extent by lack of supplies and especially by less efficient labor than formerly and a lessened supply of electric power. For a time during 1918 the power companies cut the power supply of the dredging companies down by 10 per cent, and later, for six weeks or more, then cut the supply down 33 per cent. This naturally compelled the larger dredging companies to close down some of their boats altogether and reduce work on others. Owing to these conditions one of the larger companies "scrapped" three of its oldest and least efficient dredges, thus reducing the number of operating dredges in the state. Notwithstanding these adverse circumstances the principal dredge men of the state are of the opinion that the dredge yield of gold for 1918 was not very materially less than in 1917. The loss of running time on each dredge is figured by the largest company in the state as only about 20 minutes a day; the second in rank of the companies figures a daily loss of one hour, due to inefficient labor.

No special change is shown in the drift or surface placer-mining fields of the state. However, there is a marked revival in the hydraulic mining industry after some 30 years of virtual idleness of former large producers. The result of this revival will hardly be apparent in the final figures of gold production in 1918, as most of the new work being done in the rehabilitation of the hydraulic mines is not yet finished. But at a dozen or more places in the older hydraulic mining regions of the state, in the drainage basins of Sacramento and San Joaquin rivers, heavy new concrete dams are being constructed under plans approved by the California Debris Commission. All this work is being done on old mines, that were formerly productive but were closed down 25 or 30 years ago, when the Federal Government ordered the impounding of debris in settling basins behind permanently constructed restraining dams.

Gold mining in California has for several years been following the natural trend in industrial affairs all over the world. The productive activity in the gold-mining industry is being gradually transferred from the smaller to the larger uits. Those mines which continue to be worked consist of the richest, best, and most highly developed, while the poorer, least developed, and least profitable mines either cease to exist as active mines or are absorbed in more prosperous enterprises. The number of mines in the state producing gold was 585 fewer at the end of 1917 than at the end of 1912, which is a loss of 59.7 per cent. In the same period the number of productive quartz mines has fallen off 69 per cent; hydraulic mines, 49 per cent; dredges, 15 per cent; drift mines, 63 per cent; and surface placers, 55 per cent. The total gold output of 1917, however, shows a 2 per cent increase over that of 1912. There is not

space in this brief review to consider even the main facts explaining these conditions. It must suffice to say that the decrease in number of productive gold mines in California cannot be attributed to war conditions alone.

The silver output from California mines in 1918 is estimated at 1,533,000 ounces, valued at $1,483,000, compared with 1,775,431 ounces in 1917, valued at $1,462,955, a decrease of 242,417 ounces in quantity and an increase of about $21,000 in value. The silver was derived mainly from the copper and lead ores, although an appreciable quantity is also mined with the gold. Owing to the rise in the value of the metal some few old silver mines in the southern part of the state have been reopened but none on any large scale.

The estimated mine yield of copper in California in 1918 is 48,538,000 pounds, valued at $12,013,000, compared with 48,153,139 pounds, valued at $13,145,807 in 1917, an increase of 384,958 pounds in quantity and a decrease of $1,133,000 in value. Shasta county continues to be the most productive copper county, but large quantities are being produced in Pluras, Calaveras, Siskiyou, and Trinity counties, and smaller quantities in most of the other metal-producing counties of the state. Scarcity of skilled labor and war conditions generally prevented a much higher output of copper in California than the estimate exhibits.

The mine output of lead in California in 1917 was 21,868,626 pounds, valued at $1,880,-702; the estimated yield for 1918 is 14,655,800 pounds, valued at $1,099,000. This is a decrease in quantity of 7,212,819 pounds and in value of $782,000. The lead comes mainly from the southern counties of the state, but lack of sufficient labor and the high costs of mining caused a curtailment of operations during the year.

The estimated zinc output of the state in 1918 is 4,697,900 pounds, valued at $385,200, compared with 10,872,716 pounds, valued at $1,109,017, in 1917, which is a falling off in quantity of 6,174,825 pounds and in value of $724,000. The direct reports from the few large properties producing zinc in Shasta and Inyo counties show that their outputs were very much restricted in 1918, their attention being directed to more profitable metals in their ores. The only large electrolytic plant in the state has been closed down.

NEW MEXICO PRODUCED 25,000,000 POUNDS OF ZINC IN 1918

The output of the mines of New Mexico for the first eleven months of 1918 and the estimated output for December, as reported by Charles W. Henderson, of the United States Geological Survey, Department of the Interior, amounted to $681,000 in gold, 868,000 ounces of silver, 9,250,000 pounds of lead, 98,620,000 pounds of copper, and 25,-000,000 pounds of recoverable zinc, valued in all at $28,625,000, as compared with $1,-067,969 in gold, 1,453,454 ounces of silver, 9,501,000 pounds of lead, 105,568,000 pounds of copper, and 30,200,000 pounds of zinc, with a total value of $34,986,765 in 1917. These preliminary figures thus show decreases of $387,000 in gold, 585,000 ounces in silver, 251,000 pounds in lead, 7,000,000 pounds in copper, and 5,200,000 pounds in zinc.

The decreased output of gold and silver was general throughout the state. Mills of the Mogollon district, Socorro county, yielded $115,948 in gold and 312,000 ounces of silver, compared with $258,620 in gold and 722,644 ounces in silver in 1917. This district in 1916 yielded $373,068 in gold and 1,008,483 ounces of silver. In 1918 the mill of the Mogollon Mines Company was operated steadily, but the new mill of the Socorro Mining and Milling Company, built to replace that destroyed by fire on October 26, 1917, was put in operation August and ran unitl October 18, when operations were suspended on account of the influenza epidemic; milling was resumed November 18. The output of gold from the Aztec mine at Baldy, Colfax county, was not so large as in 1917. The yield of gold-bearing siliceous copper ores of Lordsburg was less than in 1917, as was also the yield of the gold-bearing iron-copper ores of Orogrande. The San Pedro copper-matting plant, in Sante Fe county, was operated for only three months in 1918. The product of this plant carries both gold and silver. The gold production from Pinos Altos decreased, and there was only a small yield of gold from Whiteoaks, Lincoln county, but a small addition to the gold output was made by the new amalgamation mills at Parsons and Nogal, also in Lincoln county.

Copper, the principal metal product of New Mexico, is produced in several districts. The greater part of the output comes from the Chino Copper Company's low-grade copper deposits at Santa Rita. The ore is milled at Hurley, in a large, wet concentration-flotation plant. In 1917 this company's output was 79,501,333 pounds, compared with 83,339,782 pounds in 1918. The Burro Mountain Copper Company's operations at Tyrone were continuous. This company's concentration mill began operations at full capacity June 1, 1916. During the year a flotation plant was sent in operation at the Eighty-five mine. Shipments of copper ore from the Magdalena district, Socorro county, which had been large in 1916, were less in 1917. The Apache mine, at Hachita; the Orogrande district, in Otero county, and the Carocito district, near Scholle, also contributed some copper.

Lead ores were shipped from the central and Steeplerock districts, Grant county, and the Cooks' Peak and Victorio districts, Luna county. Considerable quantities of

lead carbonate and lead-zinc carbonate ores continued to be shipped from Kelly, Socorro county, and during a part of the year lead was shipped from the Organ mountains district, Dona Ana county. The lead smelter at Deming, destroyed by fire in October, 1917, was not rebuilt.

Decreased shipments of zinc carbonate and zinc sulphide ores were made in 1918. At Kelly, Socorro county, the principal producing mines were the Kelly, Graphic, and Juanita. The Ozark mill was operated steadily, but the Kelly mill was not in operation. At Hanover zinc carbonate ores were shipped from the Empire zinc mines and others, and zinc sulphide concentrates were shipped from the Hanover magnetic separation mill. The Cleveland magnetic separation mill, at Pinos Altos, was operated steadily, but at a reduced yield. In September, the Carlisle mill, in the Steeplerock district, Grant county, was again set in operation, and the lead concentrates were shipped, but the zinc concentrates were stored. Sulphide ores, in considerable quantities, were shipped from the Republic mine at Hanover, and several lots of zinc sulphide concentrates were shipped from the Rocky Mountain mill at Cerrillos. Zinc carbonate ores were shipped from the Magdalena, Hanover, and Cooks' Peak districts. The zinc ore and concentrates shipped from mines in 1918 amounted to 45,982 tons of 33 per cent grade, compared with 61,522 tons of 31 per cent in 1917. The Grubnau zinc-oxide plant, built in 1917 at Waldo, Santa Fe county, was operated continuously on zinc ores from Arizona, New Mexico, and Colorado.

FUEL ADMINISTRATION WORK IS TRANSFERRED TO OTHERS

After conferring with Van H. Manning, Director of the United States Bureau of Mines, and Dr. George Otis Smith, Director of the United States Geological Survey, United States Fuel Administrator Harry A. Garfield announced that the assimilation of some departments of the Fuel Administration would be begun soon by the first two named government departments.

The Statistical Bureau of the Fuel Administration is to be taken over by the Geological Survey.

The work of the Conservation Bureau is to be taken over by the Bureau of Mines, which will continue the work of maintaining the quality of coal and improving processes of mining, which have been developed by the Fuel Administration.

The Bureau of Mines also will take over the engineering program of the Fuel Administration looking to the development of electrical power at, or close to, coal mines.

PETROLEUM PRODUCTION REACHES NEW LEVEL

Output During 1918 Amounted to 345,500,000 Barrels, An Increase Over Record Figures of 1917.

Preliminary estimates by the United States Geological Survey, Department of the Interior, indicate that the quantity of petroleum marketed from oil wells and field storage tanks in the United States in 1918 amounted to 345,500,000 barrels, an apparent gain of 3 per cent over the former record output of 335,315,601 barrels, established in 1917. The output in 1918 includes no less than 6,500,000 barrels of crude oil removed from field storage during the year. The surface reserve of crude oil, held by oil producers and pipe-line companies in the United States at the end of 1918, is estimated at 123,000,000 barrels, compared with 150,000,000 barrels at the end of 1917. The Geological Survey's detailed statement of petroleum production will be made public in a few days.

COAL OUTPUT SHOWS DECREASE FOR WEEK ENDED DECEMBER 21

There was a decrease in the production of both bituminous and anthracite coal during the week ended December 21, according to the figures made public by the United States Fuel Administration. The estimate for the week places the production of bituminous at 10,136,000 net tons, and of anthracite at 1,839,000 net tons, compared with 10,616,000 of bituminous and 1,924,000 anthracite the previous week. During the corresponding week of last year the production was 10,923,000 net tons of bituminous and 1,778,000 net tons of anthracite.

The decrease in bituminous production during the week ended December 21 was largely in the Ohio, Pennsylvania, and West Virginia districts. In Illinois, Indiana and the fields south and west, slight gains were reported.

From April 1 to December 21, the total bituminous production is estimated at 441,361,000 net tons, compared with 402,824,000 net tons during the same period of 1917. For the same period the production of anthracite has been 72,541,000 net tons this year, as against 73,954,000 last year, according to the estimate. The anthracite record for the calendar years 1918 and 1917, however, will not show so great a difference.

During the week ended December 14, the total loss by all causes from 100 per cent production was 27 per cent, of which "no market" comprised 11.3 per cent, labor shortage 7.4 per cent, car shortage 4.3 per cent, mine disability 2.9 per cent, and all other causes 1.1 per cent.

JENNINGS COMMITTEE SOUNDS GOLD PRODUCTION WARNING

That the decline in the production of gold in the United States is of serious national concern is indicated by a report of a special committee of gold experts made to Secretary of the Interior Lane recently.

Several months ago the Secretary's attention was called to the rapidly increasing cost of gold production and the consequent decline of output, and realizing the importance of the gold mining industry, he appointed a special committee, headed by Hennen Jennings, the well-known gold mining engineer and consulting engineer of the Bureau of Mines, to go thoroughly into the situation and make the necessary recommendations.

The report, of interest not only to the gold mining industry but also to financial and business men, as having an important bearing on finance and credits and the consequent prosperity of the country, declares that "gold mining has been seriously injured by the war, and has been discriminated against for the protection and benefit of the Treasury, in that the export of gold and even the internal free trade in the metal was interrupted."

The committee says that prices on all commodities have advanced in terms of the government's paper money, except that of the ounce of gold, which has a fixed price of $20.67. "Thus, in reality," says the committee, "the purchasing power of gold has decreased in proportion to the increase of other commodities which in one way or another are factors in the obtaining of new gold."

"The present decrease in gold production is serious," says the committee, "as the maintenance of a sufficient gold reserve is essential to the security of our national finances and credits. The United States is the most favored nation in regard to gold reserves, holding over $3,000,000,000, or nearly one-third of that of the world, but it has contracted debts on a gold basis many times that existing before the war."

The committee gives as the principal reason for the decline in gold production the increase in operating costs in the most favored quartz mines from 57 cents to produce a dollar's worth of gold in 1917 to 70 cents in 1918.

Various means of stimulating the production of gold at this time were considered by the committee. Payment of a bonus on newly mined gold, advocated by many, is frowned upon by the committee. The elimination of the excess-profits tax on gold mining and the encouragement of larger outputs thereby is advocated, and the statement is made that larger dividends paid to shareholders will mean greater revenue for general taxation than could be obtained through any excess-profits tax.

The privilege of free export and of sale to manufacturers would stimulate production and aid gold mining, says the committee, and might also be a safeguard against inflation. The Government might increase production by assisting in improving methods of mining and metallurgy of gold ores. Possible methods of maintaining the visible gold reserve would be in the curtailment of the use of gold for manufactures and making a call on the public to turn in hoarded gold. In France voluntary contributions by the people since the war began have amounted to more than 2,000,000,000 francs. Further relief might be obtained, the committee says, by amending the War Minerals bill to include gold and voting an appropriation to be used in directing the search for new deposits.

The committee declares that the future of gold mining in the world is problematical; that the gold output of the world seems to have passed its zenith and to be on the decline.

"Virtually all economists agree that the gold standard should be maintained," says the committee. "Even those who have profound ideas as to the advisability of a different standard concur that it would be dangerous to attempt any drastic changes during the war and the readjustment period. The gold standard is of vital necessity in the regulation of foreign exchange, and shipments of gold to neutral countries should be encouraged to stabilize the value of our dollar, to insure confidence, and to promote business relations."

A number of recommendations on the assumption that the country would still be at war were made which have no application now. The members of the committee, other than Mr. Jennings, the chairman, are J. H. Mackenzie and Charles Janin, of the Bureau of Mines, and H. D. Caskey and F. L. Ransome, of the Geological Survey.

Anthracite Production Increasing

The greatest production of anthracite coal since the week ended October 12 was shown in the report on that fuel for the week ended December 14, as announced by the United States Fuel Administration.

In the week ended December 14, the production was 1,923,625 net tons, an increase of 116,850 net tons, or 6.5 per cent over the production for the week ended December 7, when the net tonnage was only 1,806,775. The week covered in the latest figures also shows an increase of 145,270 net tons over the corresponding week in 1917, when the production was 1,778,355 net tons.

Of the total, 1,197,079 net tons were prepared sizes, the greatest production of anthracite coal of that character since the week ended October 5.

NEVADA MINES PRODUCE $9,000,000 LESS DURING 1918

The value of the gold, silver, copper, lead, and zinc mined in Nevada in 1918 was over $45,000,000, according to the preliminary figures compiled by Victor C. Heikes, of the United States Geological Survey, Department of the Interior. This is a decrease of over $9,000,000 from the output of 1917, when the mines produced $54,424,580. The decrease was general, and in point of value the largest decrease was that in copper, which amounted to more than $7,000,0000.

The gold output of Nevada decreased from $6,959,468 in 1917 to about $6,700,000 in 1918. This is a comparatively small decrease when the isolation of the camps and the excessive costs are considered. Although the Goldfield Consolidated has held the record of being the largest gold producer in Nevada for several years, the gold output declined about 40 per cent. Gold from the Tonopah district was also decidedly decreased and amounted to about $1,200,000. Gold producers of the state which had an output of more than $200,000 each were the Nevada Consolidated from copper ore; the Aurora Consolidated; the White Caps, at Manhattan; the Elko Prince; the Olympic Mines, in Mineral County; the Union Consolidated, at Virginia City; and the Rochester Mines, at Rochester. Other notable gold producers were the Round Mountain property, Nevada Wonder, Dahl Placer, Consolidated Virginia, Comstock Leasing Company, and Consolidated Copper mines. There was a decided decrease in gold from the Seven Troughs district and from Churchill County. As a result of the developments at depth on the Comstock lode, that district produced more than $400,000 in gold.

The mine production of silver decreased from 12,269,969 ounces to about 10,000,000 ounces in 1918. The value of the output, however, increased from $9,286,454 to about $9,678,000. The largest output of silver, or about 5,300,000 ounces, was produced in the Tonopah district, where the principal contributors were the Tonopah Extension, Tonopah Extension, Tonopah Mining, Tonopah Belmont, and West End. Large quantities of silver also came from the Nevada Wonder, in Churchill County; and the Rochester Mines, in Humboldt County. Smaller outputs came from the Yellow Pine, Nevada Packard, Prince Consolidated, Elko Prince, and several properties at Virginia City. The Comstock district produced about 270,000 ounces, and several properties at Rochester produced about 870.000 ounces.

The mine output of copper decreased from 122,794,704 pounds in 1917 to about 105,000,000 pounds in 1918. The value of the output decreased from $33,522,954 to about $26,000,000. The Nevada Consolidated, at Ely, in White Pine County, the largest producer, contributed more than 6,000,000 pounds of copper a month, and the Consolidated Coppermines, in the same county, was producing more than 1,000,000 pounds a month. At Thompson, in Lyon County, the Mason Valley smelter was operated throughout the year at the rate of about 1,300,000 pounds a month. In this region the Bluestone mine was a large producer, and the Nevada Douglas made considerable shipments. At Luning, in Mineral County, the Wall Street shipped a large tonnage of copper ore, and in Lander County the Copper Canyon made notable production.

The mine output of lead decreased from 27,677,928 pounds in 1917 to about 20,600,000 pounds in 1918. The value of the output decreased from $2,380,302 to about $1,567,000. One of the largest lead producers in the state was the Prince Consolidated, at Pioche, which shipped iron-manganese ore containing gold, silver, and lead. From the Yellow Pine district of Clark County considerable high-grade lead ore was shipped, some lead product was separated from a lead-zinc ore, and considerable lead-zinc ore was shipped to the zinc smelters or oxide plants. Considerable lead was produced by the Combined Metals at Pioche; the Groom mine, in Lincoln County; and several properties at Eureka.

The mine output of recoverable zinc decreased from 22,307,868 pounds in 1917 to about 15,000,000 pounds in 1918. The value of the output decreased from $2,275,402 to about $1,267,000. Nearly all of the output came from the Yellowpine district, of Clarke County, though there was a distinct decrease from this region. The Consolidated Coppermines, in White Pine County, made large shipments of zinc ore, as did the Combined Metals Co., at Pioche.

Dividends declared by Nevada mining companies for the first eleven months of 1918 amounted to $7,374,458. The principal contributors were the Tonopah Belmont, Tonopah Mining, Nevada Consolidated, West End, Boss, Jim Butler, Union Consolidated, Yellow Pine, Nevada Wonder, Rochester Mines, Tonopah Extension and Nevada Packard.

Arsenic Off Export List

The War Trade Board has announced the removal of the following commodities from the Export Conservation List, effective January 6, 1919: Arsenic and compounds thereof; Arsenate of lead; Arsenate of soda; Arsenite of soda; Lead, arsenate of; Sodium compounds, as follows: Arsenate; Arsenite.

MANNING ADDRESSES CHAMBER OF COMMERCE OF UNITED STATES

"With the gradual disbanding of the present war organizations and in transforming from war to peace status, laws may be necessary. Heretofore Congress has called upon the Bureau of Mines for advice in framing certain laws, and you gentlemen can readily see that in order for us to properly advise Congress it will be necessary that we are alive to the exact situation," said Van H. Manning in the course of his address to the Chamber of Commerce of the United States. "Therefore, it is to the benefit of the industry that the Bureau of Mines be closely in touch with your problems and ideas; that we know your needs, and that we realize your aims. In order to meet this end, I hope that the oil industry, as a unit, will assist us in properly functioning by promoting a cooperative relationship between yourselves and the Government, which will remove many of the difficulties which in times past have involved you.

"The work of the Oil Administration, under Mr. Requa's direction and his able assistants, augmented by the Petroleum War Service Committee, is coming to an end, and I speak with some authority when I say that the work has been well done.

"Backed up and guided by such men as Mr. Requa and his able staff, not only did the industry but also the entire citizenry of the country respond in splendid and unprecedented manner to the necessary and patriotic calls. Looking back over this period of international crises and trying to visualize what was accomplished—and it is a most difficult task, so herculean is it in its proportions—I can only say, with a great sense of satisfaction and relief, that I am proud of the American oil industry and proud of the American citizen in his wonderful demonstration of patriotic cooperation. Whenever our Navy needed fuel oil or gasoline, it was there; whenever our aircraft needed gasoline, it was there, even if our citizens did have to go without Sunday automobiles; whenever the great fleet of our Allies needed petroleum, it was there. How great a factor, relatively, was the American oil industry in winning the war may never be definitely settled, but we know that it was of sufficient import to cause a famous British admiral at a recent jollification banquet to exclaim fervently, 'We floated to victory on oil!'"

The Ironton Engine Company have discontinued their branch office at Pineville, Ky., and have opened an office at 1501-1502 Fayette National Bank Bldg., Lexington, Ky., in charge of W. H. Patton, who was formerly located at Pineville.

CAUSES CONTRIBUTING TO OVERPRODUCTION OF CHROME

Some of the thoughts on the chrome situation picked up in Government circles are as follows:

Over-supply of chrome ores is due partly to the sudden termination of the war and the consequent decrease in requirements, and probably would have occurred to a lesser extent if the war had continued. This over-supply was brought about by

(a) A large over-estimate of their requirements by the consumers.

(b) By a production far in excess of the possibilities estimated by the producers.

(c) By the imperfect carrying out of the import restrictions from foreign sources.

The increased domestic production has been greatly stimulated by the requests of various government agencies urging the domestic producer to increase his output. Therefore, the Government has a moral responsibility in having urged increased production and having failed to enforce import restriction. The producer has a responsibility in having underestimated his possible output, and having proceeded with production without any Government contracts or definite assurances of purchase, possibly relying on action which might be taken under the Mineral Administration Bill which has been pending for the last year. The consumer is responsible to the extent of over-estimating his requirements, of offering high prices on short term contracts to the producer, and in using undue efforts to secure imports.

It is evident that while the Government has a certain amount of moral responsibility that it is by no means responsible for the whole situation.

It is estimated that the amount of unamortized capital invested by the producers is from $800,000 to $1,000,000.

Among the plans suggested for relief are the following:

(a) The payment to the producer of a lump sum to represent the amortization of his capital, but no profit on the operation.

(b) The purchase by the Government of a minimum tonnage of ore of contracts by the Mineral Bill for a limited period of time not to exceed one year.

The first plan would be the simplest and least expensive to the country. The second plan will require control of the whole production and import situation for at least two years with many difficult problems of administration. It will probably represent as much loss to the Government in view of the fact that unless a tariff is established for several years that any ore purchased by the Government would have to be resold at a loss.

SOUTH DAKOTA'S GOLD YIELD WORTH $6,853,000

The mines in South Dakota produced in 1918 gold worth $6,853,000, compared with $7,364,233 in 1917, and 164,000 ounces of silver, compared with 186,765 ounces in 1917. In addition, 67,000 pounds of lead and 90,000 pounds of copper were produced from smelting ores shipped. These are preliminary estimates, reported by Charles W. Henderson, of the United States Geological Survey, Department of the Interior.

The yield from the Homestake amalgamation-cyanidation mills fell off approximately $400,000. For several years the Homestake mine has been furnishing ore to its stamp mills, numbering 1,020 stamps in all without interruption, but in October, 1918, this company was forced to shut down 100 or more stamps. Of the other important properties, the Golden Reward mines and cyanidation mill were closed in the spring of 1918, owing to advances in cost and low-grade ores. The Wasp No. 2 mill was dismantled; the New Reliance was idle; the Bismarck mill was operated for a short period only; the Mogul mine continued operation on custom ore. The Trojan mill and mines were active. Small shipments of lead-silver ore were made from Galena, and of copper ore from Roubaix and Hill City.

Placer mines in Custer, Lawrence, and Pennington counties were not actively worked.

MINING STATUTES OF VARIOUS STATES TO BE DISCUSSED

The Bureau of Mines, Department of the Interior, has just issued the first of a series of bulletins containing the mining statutes of different states. The first of these, now ready for distribution, is Bulletin 161, "California Mining Statutes Annotated," by J. W. Thompson.

The purpose of this bulletin and others of like nature which are to follow is to point out the laws and regulations best adapted to increase safety and efficiency in the mineral industry of the United States and to aid legislative bodies in framing uniform mining laws.

The purpose of the bureau is to follow this bulletin with others that will contain complete collections of the mining statutes of the several states with annotations consisting of abstracts of the decisions of the state courts construing such state statutes. These state bulletins will be published successively, either as individual state bulletins or by grouping of states, with a view to uniformity in size.

The plan adopted will result in giving preference to some states, but as a major part of all of the preparation of the work has been performed, the successive volumes will follow without great delay.

The publication of the bulletins in an alphabetical order of the states has not been adopted, as this would not permit desirable grouping of two or more states. The State of California, by reason of its historic interest in mining and by reason of its great extent of mineral land and its vast mineral deposits, has been selected for the first bulletin of the state series.

This bulletin is sold by the Superintendent of Documents, Government Printing Office, Washington, D. C., for 20 cents.

SUGGESTS INCREASE OF DOMESTIC ANTHRACITE TO RELIEVE MARKET

Of deep human and commercial interest to members of Congress and the public were many facts brought out in the testimony of William Griffith of Scranton, before the Senate Committee on Manufactures recently.

Mr. Griffith is one of the most experienced engineers in the anthracite fields and has been a close student of both scientific and economic conditions relating to fuel and its development.

The Senate investigation was for the purpose of fixing, if possible, upon some plan or suggestion looking to corrections in the handling and distribution of anthracite, and to—if possible—encourage greater production as a means of reducing costs to consumer. Mr. Griffith, in his answers to direct questions showed that up to a few years ago the smaller sizes—such as pea coal and rice coal were not salable, and were practically wasted. Salesmen who tried to introduce the smaller sizes were looked upon as imposters. During those years, such coal was dumped upon waste piles, known as "Culm Banks."

It was while acting upon a State Commission to investigate the methods of handling anthracite that Mr. Griffith became interested in working out a method of conserving the coal supply. The report of his Commission brought to the attention of the coal companies the fact that the so-called waste was valuable. Since then the companies have been placing smaller sizes in the market.

There still remain great banks of culm which can be washed and placed in the market—though no secondary or low-priced sizes are allowed in the price schedule. Anthracite is the only commodity upon which the Government fixes but one standard and price—and it was this fact that prevented the sale and distribution of low standard, low-priced coal during the war famine. Mr. Griffith favored the introduction of a secondary grade, at a reduced price, in order to increase the

production efficiency of the mines at this time.

In discussing the successful operations of one company for which he secured a lease on one "waste" dump, Mr. Griffith stated that the lease was based upon a 40 cent royalty. The plant for cleaning the refuse cost $70,000 and would operate five years. The cost of production for the month of March was $8,031—including $1,200 monthly depreciation—the production reaching 5,826 tons for the month.

Mr. Griffith stated that he accepted as reasonable the Fuel Administration figures showing that the average cost of producing a ton of anthracite of any size, from mine or "culm dump" is $4.50. This sells at $5.00 per ton for steam fuel and $6.00 per ton for domestic use. The domestic fuel is sold at a profit while steam fuel made no profit for producers at the present price.

The prices are fixed by the group of companies controlling anthracite but are regulated by competition such as bituminous coal and its by-products, coke and gas, and water power.

New operations are impossible because the anthracite fields have reached the maximum, according to Mr. Griffith—at least two big companies have exhausted their development possibilities. Production has reached its peak.

"As a conclusion from these facts it is my opinion that any scheme that will increase the supply of domestic coal should be acceptable to all interests in the first place and, in addition, a marketing of a low-grade or a second class domestic coal at correspondingly low prices will lead to the conservation of thousands of tons of domestic coal from culm piles, from waste piles and from condemned coal in the breakers," said the engineer.

Mr. Griffith showed that the peak in anthracite production was reached in 1910, and since then production has fallen each year. He expressed the belief that the limit of production had been reached. Some of the collieries have been kept going—high or low prices—because to cease would mean ruination from flooded works, while—often to produce entailed losses and in spite of the undisputed fact that they were depleting their stock—exhausting their capital without adequate returns.

In 1916 there were 800 collieries in the anthracite field, producing an average of 99,000 tons each.

Mr. Griffith submitted a unique but most comprehensive chart—summing up the anthracite situation—and which is reproduced herewith by his permission.

Anthracite coal, November 29, 1918. According to statistics of the Fuel Administration cost $4.50 per ton, average sale price $5 per ton.		
	1—Output composed of domestic fuel, in prepared sizes for household use in stoves; average cost about $4.50, sale price $6 or more. Profitable, quantity 50 per cent of the total output or less.	1—Competitors of domestic fuel, regulate the prices and are bituminous coal, and its by-products, coke and gas, electrically produced by bituminous coal, anthracite steam sizes and water power, third natural gas, anthracite briquettes.
	2—Output composed of steam fuel; small sizes, not suitable for domestic use in stoves, cost $4.50 per ton, sale price $3 per ton or less; useful under force draft only. Unprofitable, quantity 50 per cent more or less of the total output.	2—Competitors of the steam fuel are low-grade bituminous coal and water power.
	1—Domestic sizes; increase in production impossible; region has reached its maximum; new operations cannot more than replace the exhaustion of the old ones; prices regulated by fierce competition of many competitors	1—Decrease in proportion of domestic sizes means a net loss to the coal trade and a loss in comfort to the people.
	2—Increase of small sizes is easy, but at great reduction in market price; substitutes are low-priced and plentiful; increase of small sizes means decrease in proportion of domestic sizes; because cars used for transporting small sizes reduces the car supply for domestic sizes	2—Increase in proportion of small sizes means a net loss to the coal trade and no great advantage in the homes of the people. It is not useful in the stoves.

The adoption of the suggestions made would be useful to:

People in their homes, who need more domestic sizes but do not require more steam sizes;

Industry, which requires more steam sizes but can use substitutes;

The coal trade, which needs more domestic sizes but does not need more steam sizes.

OREGON INCREASES ITS COPPER OUTPUT IN 1918

A preliminary estimate of the production of metals in Oregon in 1918, compiled by Charles G. Yale, of the San Francisco office of the United States Geological Survey, Department of the Interior, shows a decrease only in the yield of gold, with an increase in that of silver, copper and lead. The output of gold in 1917 was, according to the mines report, $1,491,798, and the estimated output in 1918 is $1,270,300, a decrease of about $221,500 for the year. The silver output in 1917 was 125,656 fine ounces, valued at $103,541, while in 1918 it was 148,200 fine ounces, valued at $143,500, which shows an increase in quantity of about 22,500 fine ounces, and in value of about $40,000. The yield of copper in 1917 was 2,474,487 pounds, valued at $675,535, and in 1918 it was 2,935,000 pounds, valued at $726,400, which is an increase in quantity of 460,500 pounds and in value of $50,800. There was no output of lead in 1917, but in 1918 the mines reported a production of 4,364 pounds, valued at $300.

In common with the other gold-producing states of the Union, Oregon showed a falling off in gold yield in 1918 as compared with 1917. This was due, however, not so much to war conditions that affected the deep mines as to the decrease in output from the gold-dredging industry, by far the most important single factor in the gold yield of the state. Direct returns received from the dredging companies of the state show a decline in gold yield of $236,900 in 1918, compared with the total figures from this source in 1917. As the total gold decrease in Oregan for the year was $221,500, it is seen that the deep mines of the state more than held their own, notwithstanding the unfavorable conditions due to the war. Moreover, most of this decline was due to the permanent closing down in 1918 of one of the large dredges, its ground having been worked out. There are now three dredges operating in Oregon.

The larger copper companies, in Baker and Josephine counties, did much better in 1918 than in 1917, both in quantity and value of output. This accounts also, in part, for the increase in silver yield, more than one-third of the Oregon silver being derived from copper ores. The rest of the increase of silver comes from siliceous ore, very little being taken from the placer gold.

Most of the placer mines of the state are worked by the hydraulic system, but the yield of gold in all forms of placer mines combined does not nearly reach that of the dredges. There are only a little over 100 producing mines in Oregon, including all classes, and the hydraulic mines are the most numerous. Of the deep mines about twenty-five produce gold from siliceous ore, and there are seven active copper properties. The entire output of ore from all the deep mines combined is between 140,000 and 150,000 tons annually.

The largest proportion of gold and other metals in 1918 came, as usual, from Baker county, which produces annually about 90 per cent of the gold mined in the state. Grant county comes next in rank in gold production, having exceeded Josephine county by reason of its dredging industry.

LIGNITE BILL IS REPORTED FAVORABLY TO THE HOUSE

A bill providing for the determination of the practicability of utilizing lignite coal and appropriating $100,000 for that purpose has been reported favorably by the Committee on Mines and Mining of the House of Representatives. A valuable statement as to the possibilities of lignite was printed as a part of the committee's report. The number of the report is 840, and can be obtained on application to the House document room. An extract from the extensive statement is as follows:

"When classified according to rank, the coals of the nation fall into three groups:

"1. Anthracite, semi-anthracite, semi-bituminous, and bituminous coals.

"2. Subbituminous coals.

"3. Lignite.

"This classification as to rank rests, in a measure, upon the percentage of volatile matter, oxygen, and moisture contained in the coals. There is, speaking generally, a progressive loss of these elements in passing from lignite to anthracite. But chemical criteria alone are not a sufficient basis for such classification. The dividing line is really determined by physical characteristics which directly affect the market value of the coal.

"While subbituminous coals generally have more moisture than bituminous coals, there are so many exceptions to the rule that it has very little value as a means of distinction. But there is a very marked difference in their behavior upon weathering. The subbituminous coals, on exposure, give up their moisture more readily, resulting in shrinkage, irregular cracking, and a measure of disintegration; whereas, the bituminous coals shrink very little and there is practically no disintegration due to drying.

"Again, the distinction between subbituminous coal and lignite is not clearly defined chemically, but the physical difference is marked. The subbituminous coal is black and shiny, has little trace of woody structure, carries less moisture, and has a greater heating value than lignite, and is capable of producing a coke of fairly good quality. Lignite, on the other hand, is

brown, dull, markedly woody in texture, has no coking quality whatever, carries a greater percentage of moisture (30 to 40 per cent), which it parts with very readily, and hence the disintegration on exposure is so great as to largely prevent its shipment during the summer months.

"The nation's coal resources of all ranks total 3,553,637,100,000 minable tons. Of this total 1,051,290,000,000 tons, or nearly one-third, is lignite. Of this lignite 964,424,000,000 tons are located in North and South Dakota and northeastern Montana; in Texas, approximately 23,000,000,000 tons; in Alaska, 7,404,300,000 tons; and relatively smaller quantities in several of the other Western and Southern States. (Geological Survey Professional Paper 100.)

"The lignite tonnage given above includes only Group 3; it does not include Group 2, subbituminous coals, which in earlier days were called 'black lignites' and classed in the lowest rank among coals.

"It is an important economic consideration that these lignites are found in sections of the country which have no other solid fuel.

"A large number of samples of North Dakota and Saskatchewan lignite averaged:

	Per cent.
Moisture	26.13
Volatile hydrocarbons	28.11
Fixed carbon	38.16
Ash	6.86
Sulphur	.74

"The large percentage of moisture contained in the lignite has not been absorbed from extraneous sources, but is the portion remaining from the great amount of water present in the peat from which the lignite was derived. This water is poor stuff to pay freight on or to put into a furnace. The lignite fires very quickly from spontaneous combustion, making storage of it in any large quantities exceedingly difficult. It does not 'coke' in the sense that bituminous coal cokes, but rather crumbles when being carbonized or when thrown onto the fire, and this gives rise to difficulties in firing and substantial loss through the grate bars.

"For these reasons the lignite is not a very desirable fuel as mined, and millions of tons of bituminous and anthracite coals are shipped annually into these lignite-bearing sections—literally 'carrying coals to Newcastle'—resulting in high prices for both industrial and domestic fuel, necessarily imposing a great handicap upon the industrial development of these sections, the tying up of transportation equipment much needed for other service, and in other substantial economic lost motion.

"The economic problem is not a local but a national one.

"In Texas there is some bituminous coal, but not enough to supply the railroads.

"In Alaska $50,000,000 are being spent on a railroad there, and it seems probable that the development of a large part of the territory served by this railroad will depend upon the utilization of lignite.

"In North Dakota in 1917 there were mined 603,000 tons of lignite and imported 717,000 tons of bituminous coal from Lake docks, Indiana and Illinois.

"In South Dakota in 1917 there was mined 12,000 tons of lignite and imported 792,000 tons of bituminous coal from the Lake docks, Kentucky, West Virginia, Iowa, Indiana, and Illinois.

"Minnesota, having no coal of her own, in 1917 imported 7,203,000 tons of bituminous coal from the Lake docks, Kentucky, West Virginia, Ohio, Tennessee, Iowa, Arkansas, Indiana, and Illinois.

"The economic waste involved in this almost transcontinental shipment of coal is little short of criminal."

Import Restrictions Modified

The War Trade Board announces that the regulations governing the importation of copper ore and copper concentrates announced in W. T. B. R. 249, October 4, 1918, have been modified, and that henceforth they will consider applications for license to import copper ore and copper concentrates as follows:

1. For copper ore originating in and coming from Korea, Newfoundland, the West Indies, France, England, the West Coast of South America, Cuba, Canada, and Mexico, irrespective of the content of copper.

2. For copper ore originating in and coming from Spain only when containing more than 2 per cent of copper.

3. For copper concentrates from Cuba, Canada, and Mexico, irrespective of the content of copper.

4. For copper concentrates from any non-enemy country other than Cuba, Canada and Mexico, only when containing 50 per cent or over of copper.

There is no restriction upon the importation of copper matte or blister copper.

Requisitions Cancelled

All of its requisitions for the shipment of bituminous coal to industrial plants have been cancelled, according to an announcement by the United States Fuel Administration.

The policy of the Fuel Administration hereafter will be to leave to the plants themselves the work of obtaining such fuel. It believes, however, that none will have any difficulty in obtaining sufficient supplies.

POTASH PROBLEM PUT UP TO INTERIOR DEPARTMENT

At the direction of the President, the Chemicals Division of the War Industries Board has turned over the Department of the Interior the problem of increasing the potash production of the United States. This action was taken in order that an established branch of the Government may permanently set itself to the task of emancipating the American farmer from the grip of Germany's monopoly on the world's supply of fertilizer material.

Before the signing of the armistice the War Industries Board had already attacked the problem. Chairman Baruch himself had appeared before a Congressional Committee in behalf of an amendment to the revenue bill which would give encouragement to private industries who would undertake the risk of establishing potash production in this country. The Chemicals Division, on the other hand, in cooperation with other departments of the Government, had turned its attention to the specific task of extracting potash from waste products. A committee of experts, representing the steel and iron industry of the country and certain scientific departments of the Government, was in process of formation, under the auspices of the Chemicals Division, at the time hostilities ceased. Its purpose was to determine as quickly as possible the feasibility, from a commercial standpoint, of extracting potash from the fumes of blast furnaces.

Prior to the outbreak of the war, Germany, by reason of her monopoly of the potash supply, had gradually extended her arm around the food crops of the world. It was to Germany that the farmers of this and other countries had to look for the principal ingredient of their fertilizers. Nowhere else were to be found the vast potash deposits, contained in rock salt, which insured to the German potash exporters a natural supply sufficient to meet the demands of the world for several thousands of years to come.

When the outbreak of the European war suddenly cut off this supply, the situation of the American farmer was for a time desperate. Under the stimulus of necessity, efforts were launched by private industries to meet the situation, and in consequence there has been a considerable development in the amount of potash produced in this country. By no means, however, has this development approached the requirements of the country. Before the war the American imports of pure potash from Germany for the year ending July, 1914, amounted approximately to 250,000 tons. Last year there were produced in the United States 32,000 tons, and this year it is estimated that the output will amount to about 60,000 tons.

The War Industries Board undertook to approach the problem in a larger way, and it is now proposed by arrangment between the Chemicals Division and the Department of the Interior for the program to be carried forward by the latter department.

The suggestion of extracting potash from blast furnace fumes is based on the fact that potash in varying quantities is found not only in the iron ores but in the coke and lime used in reducing the ores. In Alabama the ores are particularly rich in potash. At present this potash is allowed to escape during the processes of the blast furnaces. Divided into microscopic particles of dust it is volatilized and carried off with the waste fumes.

Several methods of saving this potash have been suggested by scientists. Of these the most feasible appears to be the electric-precipitation process devised by Dr. Fred D. Cottrell, of the Bureau of Mines. This involves cooling the gases as they emerge from the blast furnaces and passing them through a series of sheet steel tubes, eight to twelve inches in diameter. Through the center of these tubes is run a wire, or chain, carrying a high voltage charge of static electricity. This electric charge tends to electrify the fine particles of potash dust, causing them to consolidate, or "colonize" and drop down the sides of the tubes. A fair-sized installation for this process requires as many as 400 of these tubes through which to pass the gases. It is this process which the Bethlehem Steel Company has experimented with on a small scale.

Another method tried out involves the spraying of the gas fumes with water and passing them through moist bags, which retain the potash. This method has been tried out in extracting potash from the fumes given off in the manufacture of cement. Its first practical application took place when a cement plant located near Redlands, California, undertook, in response to neighborhood protests, to cut down the volume of fumes emitted from its chimneys. Other cement plants have tried it out, and in the East the Security Cement and Lime Company at Hagerstown, Md., has been foremost in the recovery of potash from cement dust. Cement mixture contains potash in proportions varying from 1 per cent to 1 1-4 per cent. When calcining cement clinkers, the addition of salt to the coal that is burned in the kiln renders the potash soluble in water.

At a conference of experts recently held in the office of C. H. MacDowell, Director of the Chemicals Division of the War Industries Board, the opinion prevailed that

it would be entirely feasible to commercially develop a method of extracting the potash from blast furnace fumes, particularly in regions where the blast furnaces are located near ores in which potash occurs in quantities sufficient to insure substantial recoveries. The problem presents many technical difficulties since care must be taken in developing a by-product process not to interfere with the primary output.

The potash deposits in Germany resulted from the crystallization of sea water. In all of the 202 mines in that country, the potash is found in water-soluble form and for certain purposes can be used just as it comes from the mines without further refining. At Searles Lake, California, potash in this water-soluble form has been found in small quantities, and two factories have been established there to extract it. In Nebraska it has been possible to recover potash in fair quantities from certain alkali lakes located in that state. In Utah, Mr. MacDowell himself established a plant at which pure potash is recovered from alunite.

Elsewhere experiments have been made in recovering potash from certain by-products, such as beet-root molasses and wool scourings. Other scources of supply being studied are the potash shales of Alabama and Georgia, the green sands of New Jersey and the leucite deposits of Wyoming. There is, in fact, a considerable development now under way in the production of potash from leucite; and production likewise has been undertaken in Utah from certain brines contained in salt deposits west of Salt Lake City.

Unquestionably it is going to cost much more to produce potash in Germany and Alsace. War taxes, high food costs and other fundamentals will bring this about so that it will be a long time before European potash is brought to this country at the low cost prevailing before 1914.

Permit Order Unnecessary

Shippers of bituminous coal to Canada were not required to obtain Canadian permits after December 9, according to an announcement made by the United States Fuel Administration.

This cancellation of a provision of an order issued September 19, 1917, has no effect upon the requirements of the same order in respect to anthracite coal.

The movement of bituminous coal to Canada must still be made by the customary routes, and within the zones to which producers may ship, except in cases where permits for out-of-zone movements to the Dominion have been issued by the Fuel Administration.

Alaska Chapter Formally Organized

At a meeting of the Tanana Valley Miners Association, held at Fairbanks, Alaska, August 30th, there was completed the organization of the Alaska Chapter of the American Mining Congress.

A convention of operators was called October 18th in Fairbanks and the following directors were elected for the Chapter: F. C. Bleecker, W. T. Burns, L. D. Colbert, C. M. Crites, John A. Davis, John Gross, L. C. Hess, S. Howell, Paul Hopkins, James A. Haney, Albert Johnson, G. A. MacQuarrie, Ben Thompson, Lars. Westenvick, J. F. Zimmerman.

The directors elected the following officers for the ensuing year:

Governor, John A. Davis; Vice-Governors, Ben A. Thompson, G. A. MacQuarrie, James A. Haney; Treasurer, J. F. Zimmerman; Secretary, (Not yet chosen); Executive Committee, G. A. MacQuarrie, John Gross, John A. Davis.

It is the intention of the Chapter to hold meetings once a month, at which one of two papers will be read on mining subjects of interest to the District, followed with general discussion by those present.

At these monthly meetings, also, there will be opportunity for discussion of any local problem, or recommendations for the benefit of the mining industry. For example, at the November meeting, the question of starting the attempt to secure Federal aid for prospectors was to be taken up and discussed.

The operators present at the October convention appointed a committee to secure accurate data as to the advanced cost, since 1914, of all materials and supplies necessary in mining. The report of this committee will be forwarded to the American Mining Congress as soon as completed and it is believed that the information thus secured will be helpful in considering future activity in behalf of the gold producers.

The membership of the Alaska Chapter was materially increased at the October meeting, a large number of both active and associate members being recorded. John A. Davis, the Governor of the new chapter, is Director of the Bureau of Mines experiment station in Fairbanks and an enthusiastic believer in organized mining effort. The annual meeting of the Alaska Chapter will occur July 3rd of each year as such places as may be designated by the Board of Directors.

Governor Davis expresses the belief that the chapter will be of material aid to the operators in Alaska, both as a matter of commercial affiliation and general advancement of educational information among the operators and their men.

MINERAL OUTPUT 43 PER CENT GREATER THAN EVER BEFORE

Production in 1918 Exceeded $5,000,000,000, or Billion and a Half Greater Than Record Year of 1917.

The value of the minerals produced in the United States in 1917, according to the United States Geological Survey, Department of the Interior, was $5,010,948,000, an increase of $1,496,796,000, or about 43 per cent, over the former record, $3,513,972,000, established in 1916. The blast furnace products (pig iron and ferroalloys), copper, coal and petroleum contributed 74 per cent of the total value of minerals produced and 88 per cent of the increase in 1917.

The metals established a new record in 1917, being valued at nearly $2,092,000,000 and representing 42 per cent of the total value of the mineral product. They showed an increase of about $471,316,000, or 29 per cent, over the $1,620,508,000 reported for 1916. The blast furnace products contributed nearly 90 per cent of the total increase. Increases were also made in the value of aluminum, copper, lead and silver, but decreases were recorded in the value of gold and zinc.

The value of the non-metallic products in 1917 was 58 per cent of the value of all minerals produced, increasing $1,010,459,000, or nearly 54 per cent, from the former record of $1,878,464,000 in 1916 to $2,888,923,000 in 1917. Of this total increase coal alone represented nearly 66 per cent, and coal and petroleum combined contributed about 85 per cent.

SULPHURIC ACID REQUIREMENTS FOR 1919 ARE DISCUSSED

A memorandum concerning the Present Sulphuric Acid Capacity and Estimated Requirements for 1919 has been prepared by Arthur E. Wells, Metallurgist of the United States Bureau of Mines.

Mr. Wells has made a very thorough study of the acid situation in the United States since the beginning of the war in 1914 and the figures submitted by him can be considered as coming from one of the best authorities on the subject in Washington. The reports read as follows:

On January 1, 1918, the total manufacturing capacity of the country for acid was 427,000 tons per month, (basis 100 per cent H_2SO_4), or 8,200,000 tons per year (basis 50 degrees Be), of which 29 per cent was at contract acid plants.

On November 1, 1918, the total manufacturing capacity of the country was 500,000 tons per month (basis 100 per cent H_2SO_4), or 9,600,000 tons per year (basis 50 degrees Be). Of this total capacity 40 per cent was at contract acid plants.

This capacity was divided among (1) government, (2) explosives companies, (3) all others, including commercial manufacturers, by-product manufacturers, etc., as follows:

	Capacity Expressed as tons per month, 100 per cent.	Capacity Expressed as tons per year 50 degrees Be.
(1) At Government plants	54,000	1,040,000
(2) At plants of Explosives manufacturers	58,000	1,120,000
(3) All others	388,000	7,440,000
	500,000	9,600,000

Inasmuch as the acid market conditions in the intermountain and Pacific Coast districts are quite distinct from those in the east, and as there has been brought about very little, if any, disturbance in those districts except for possibly some slight disturbances in the San Francisco district, it is not necessary to include the figures for those districts in the discussions regarding eastern conditions.

The total capacity east of the Mississippi river, and also including the plant at Argentine, Kansas, and the plants in Louisiana and Arkansas, is as follows:

	Tons per month as 100% H_2SO_4
(1) At government plants	54,000
(2) At plants of explosives companies	50,000
(3) All others	350,000
Total	454,000

If we assume that the government plants and the contract plants which were built by the explosives companies primarily to supply acid for munitions explosives, are not operated in 1919, or if operated at all, the production will be utilized only for munitions and thus will not be placed on the market, there remains a total capacity to be considered in the eastern part of the United States amounting to 365,000 tons per month (basis 100 per cent H_2SO_4), or 7,000,000 tons per year (basis 50 degrees Be).

During the first nine months of 1918 the actual rate of production was only about 90 per cent of the rated maximum capacity, although many plants were operating much above the rated capacities. Therefore, it is fair to conclude that the probable maximum output from these plants during the

year 1919 cannot be greater than 90 per cent of the rated capacity, or in other words, the maximum output could be only about 328,000 tons per month (basis 100 per cent H_2SO_4) or 6,300,000 tons per year (basis 50 degrees Be).

Durng the months of June, July, and August, 1918, the following industries in the eastern part of the United States consumed approximately the following tonnage of acid:

Industries.	Tons per month basis 100% H_2SO_4
1. Domestic explosives	7,500
2. Fertilizers	109,400
3. Chemicals and drugs, including nitric acid, hydrochloric acid, ammonium sulphate	37,600
4. Oil refining	28,700
5. Steel pickling and galvanizing	36,200
6. Fabrics, textiles, tanning, rubber, paper, bleaching	5,100
7. Paints, lithopone, dyes, glue, glycerine, alcohol	.....
8. Storage batteries, metallurgical work	4,700
9. Miscellaneous and unknown	4,600
Total	240,000

or 4,600,000 tons per year (basis 50 degrees Be).

It is believed that the consumption of acid in the various industries during the period as given above offers a better basis for estimating the future consumption during 1919 than any reference to the figures of 1914. However, it may be stated by way of comparison that in the eastern half of the United States, there were consumed in 1914 about 3,500,000 tons of acid (basis 50 degrees Be), according to the figures compiled by the U. S. Geological Survey. From these figures, it is evident that between the years 1914 and 1918, there was an increase in the requirements of acid for industries, other than munitions explosives, amounting to about 1,000,000 (basis 50 degrees Be). The consumption of acid for fertilizers will undoubtedly be greater in 1919 than in 1918, and will probably average at least 130,000 tons per month (basis 100 per cent H_2SO_4), or 2,500,000 tons per year (basis 50 degrees Be). Thus, with general business conditons favorable, the average monthly consumption of acid in the above industres in the eastern part of the country during the year 1919 should not be less than 260,000 tons per month (basis 100 per cent H_2SO_4), or 5,000,000 tons per year (basis 50 degrees Be). This would require operating all the plants at about 71 per cent of the rated maximum capacity, if the business was distributed over the district proportionately to the manufacturing capacity in the various districts. As a matter of fact, the southern fertilizer plants will probably operate to full capacity, while plants in Boston, New York, Philadelphia, and Baltimore districts may have to average less than 70 per cent of the rated capacity.

The production and consumption of acid in the western half of the United States will probably be about 500,000 tons per year (basis 50 degrees Be), so that the total production for the whole country will be about 5,500,000 tons in 1919.

DEPLETION OF PETROLEUM STOCKS CONTINUES IN OCTOBER

The moderate loss in the quantity of petroleum moved from wells and field storage tanks charged in October to the Gulf Coast field was more than offset by the gain credited in that month to the other fields listed, and the result was a net gain of 5.3 per cent, compared with September, 1918, but a net loss of 3.5 per cent compared with October, 1917. The average daily rate of petroleum movement in October, indicated by these figures, was 1.3 per cent greater than in September, 1918, and 3.5 per cent less than in October, 1917.

Withdrawals in October from stocks of Oklahoma-Kansas and Rocky Mountain oil considerably exceeded the moderate additions made to stocks of other oils, and the result was a net depletion of about 2,000,000 barrels during the month. Since October 31, 1917, stocks of petroleum in the fields to which this summary relates have been depleted by about 26,000,000 barrels.

The quantity of petroleum apparently consumed in October, 1918, was 3.1 per cent less than in September, 1918, and 4.2 per cent less than in October, 1917, the average daily rate of consumption being 6.2 per cent less than in September, 1918, and 4.2 per cent less than in October a year ago.

The above was prepared under the supervision of J. D. Northrop, of the Geological Survey.

New Solicitor for Fuel Administration

Announcement has been made by Fuel Administrator Harry A. Garfield of the appointment of Frank E. Harkness as solicitor of the United States Fuel Administration.

The Van Kirk-Carrol Coal Company recently opened a new mine at Dell Roy, Ohio, and has equipped it with Jacobsen & Schraeder's screens, and their equipment for picking and loading coal. This equipment has been so satisfactory that they have decided to install it in all of their properties.

NORMAN CARMICHAEL NEW GOVERNOR ARIZONA CHAPTER

The annual meeting of the Arizona Chapter American Mining Congress convened in Phoenix on the 4th. Business of the two-day session included election of directors and their organizations. The old board of directors was reelected in full.

Capt. J. P. Hodgson, twice elected governor of the chapter, declined a third term and nominated Norman Carmichael of the Arizona Copper Company of Clifton for the high office of the organization. Mr. Carmichael received the unanimous vote of the meeting. Robert E. Tally of United Verde was elected first vice president, W. B. Gohring of Calumet & Arizona, second vice president, and G. H. Dowell of Phelps, Dodge Corporation, third vice president.

J. E. Curry was reelected secretary of the chapter and H. J. McClung, treasurer. All elections were by unanimous vote. Headquarters of the chapter continue at Bisbee. In attendance at the meetings were representative mining men from all of the producing districts of the state.

PLACE IN CABINET

Matters of importance discussed included renewal of urgency by the chapter that mining be given a place in the national cabinet and the endorsement of the principle of plans proposed for expansion of the activities of the National Mining Congress organization, particularly with reference to broader work in the statistical field and greater cooperation of all the mining divisions—coal, iron, copper, etc.—to the end of general gain for the industry in public consideration and in usefulness to all elements in the country.

The report of Secretary J. E. Curry for the past year included much of interest and is quoted from as follows:

COPPER PRODUCTION

"The copper production of the state of Arizona for the year 1918 is estimated to be 829,000,000 pounds, as against the previous year's production of 700,000,000 pounds, showing an increase of 129,000,000 pounds. Not included in above figures might be conservatively estimated 500,000 pounds of copper produced by Arizona mines from shipments of ore to smelters outside the state.

SUPPLY OF COPPER

"It is estimated that more copper has been produced since July than has been sold, yet apparently there has been a shortage in supply. The shortage, however, is unreal and is accounted for by delays in refining and transportation. Forcing production has been the rule. Keeping up production, handicapped by a shortage of labor with which to carry on development, has brought many mines into a restricted productive capacity. Advance development work must be done before the properties will again be at their best.

COST OF COPPER

"The advance in wages, freight rates and the increased cost of all supplies, together with war taxes, has brought the cost of producing a pound of copper to more than double pre-war cost and in many instances materially higher.

"With no reduction in wages, freight rates or supplies, there is no inducement for mining companies to continue forcing output even upon the continuance of the present market price of 26 cents a pound.

EFFICIENCY OF WORKING FORCES

"In mining and manufacturing generally, it is reported there has been notoriously diminished efficiency in work per hour or shift. Although wages are higher, efficiency is low. While this is clearly noticeable in manufacturing, it is more real than noticeable in mining when per ton or ore per man is taken into consideration. Figures may be set up to show that efficiency has either increased or decreased, but personal observation will, in every instance, show efficiency in working forces since the pre-war period has materially decreased."

MONTANA INCREASES MINERAL YIELD BY $12,000,000 IN 1918

The value of the gold, silver, copper, lead, and zinc mined in Montana in 1918, according to the estimate of C. N. Gerry, of the United States Geological Survey, Department of the Interior, was more than $122,000,000, an increase of about $12,000,000. There was a decided decrease in the gold output, but increases in all the other metals. The output of Montana depends principally on the activity of the mines at Butte, and though these did not make a record output their yield was not seriously curtailed by labor strikes, as it was the year before.

The value of the gold output decreased from $3,517,253 in 1917 to about $3,177,000 in 1918, in spite of the fact that gold from copper ores probably increased. One of the main reasons for this difference was the decreased output from the Conrey dredges, in Alder Gulch, Madison county. Gold from the properties of the Barnes King Mining Co. was also much less than in 1917, though the company is still one of the chief gold producers in the state. The Southern Cross mine, at Georgetown, from which iron ore is shipped, was the third largest gold producer of Montana. Some very rich ore came from the Scratch Gravel mine, in Lewis and Clark county.

The mine output of silver increased from 13,120,142 ounces in 1917 to about 16,000,000 ounces in 1918, and the value of the output increased from $10,817,589 to about $15,600,000. This total makes Montana the leading silver producer of the United States. As in past years, most of this silver came from copper

ores, but a large part of the increase resulted from residues from zinc ores, either those smelted in the East or those treated in the electrolytic plant at Great Falls. The principal contributors of silver were the combined Anaconda properties and the Butte and Superior, the North Butte, the Elm Orlu, the Davis Daly and the Tuolumno.

The output of copper increased from 274,462,574 pounds in 1917 to about 328,000,000 pounds in 1918. This represents an increase of nearly 54,000,000 pounds in quantity and over $6,000,000 in value. However, the increase was unusual, for the year 1917 was not a normal one as the main properties were idle for several months. The average monthly production from the smelting plants of the Anaconda Copper Co. at Great Falls and Anaconda, according to published statements, was about 24,500,000 pounds of copper. The Pittsmont plant of the East Butte Co. produced approximately 2,000,000 pounds a month. Aside from the mines of the Anaconda and East Butte companies, the North Butte, Davis Daly, Elm Orlu, Butte and Superior, Butte Duluth, Tuolumne, and Bullwhacker yielded considerable copper.

The mine production of lead increased from 21,951,220 pounds in 1917 to about 35,000,000 pounds in 1918. The value of the output increased from $1,887,805 to about $2,668,000. A large part of the lead came from the lead-zinc ores of the Anaconda properties at Butte, treated at Great Falls. The Butte and Superior property at Butte, and the Snow Storm Mine at Troy, Lincoln county, were also notable contributors. Smaller quantities came from the Angelica and Pilgrim mines, in Jefferson county, and the Davis Daly property, at Butte. The unusual increases in both lead and silver are due to the marketing of by-products from the electrolytic zinc plant at Great Falls.

The output of recoverable zinc in Montana increased from 186,259,331 pounds in 1917 to about 210,000,000 pounds in 1918. The value of the output increased from $18,998,452 to $19,551,000. The three main zinc producers of Montana were the Butte and Superior, the Anaconda mines, and the Elm Orlu property. Other noteworthy producers were the Snow Storm mine, in Lincoln county; the Davis Daly, at Butte; and the Emma mine of the Butte Copper and Zinc Co. Many of the Western states showed decreases in zinc production in 1918, but Montana produced an unusually large quantity on account of the activity of the plant at Great Falls, which was making about 6,000,000 pounds of spelter a month.

Dividends paid by Montana companies for the first eleven months of 1918 amounted to $19,754,870. The principal dividend payers were the Anaconda, North Butte, Butte Copper and Zinc, Davis Daly, and Barnes King.

UTAH'S 1918 MINE OUTPUT WAS WORTH $87,600,000

The output of gold, silver, copper, lead, and zinc from the mines of Utah in 1918, according to Victor C. Heikes, of the United States Geological Survey, Department of the Interior, had a value of about $87,600,000, which represents a decrease of nearly $12,000,000 from the value of the output in 1917. Except in silver, the production of which increased slightly, there were decreased in all five of the metals produced. The average price of silver for the year was much higher than in 1917, but the prices of copper, lead, and zinc were less. The industry in general was greatly hampered by the scarcity of labor and the unusually high cost of materials and supplies.

The four smelting plants of the state were actve throughout the year, on both Utah ores and custom ores, but they were not run at full capacity during the entire year and no records were made.

The mine producton of gold decreased from $3,355,156 in 1917 to approximately $3,000,000 in 1918, a decrease of nearly 10 per cent. Most of the gold came from copper, lead, and zinc ores treated at smelting plants. No great amount of ore was either amalgamated or cyanided.

The mine output of silver increased from 13,479,133 ounces, valued at $11,106,806, in 1917, to about 13,680,000 ounces, valued at 13,200,000, in 1918. Although this is not a large increase in quantity, it is rather surprising that the output was upheld, inasmuch as there were decided decreases in all the other metals. The main increase in silver production came from the Tintic Standard mine, north of Eureka. The Chief Consolidated held the record of producing more silver than any other mine in the state. Silver from the Park City district was conside bly less, though a notable quantity came from the shipments of ore from the Ontario mine. In the Bingham district the Utah Apex and Utah Copper were the largest silver producers, followed by the Utah Consolidated.

The mine production of copper decreased from 246,674,153 pounds in 1917 to 233,000,000 pounds in 1918. As the price was somewhat less, the value of the output decreased from $67,342,044 to about $57,664,000. The largest production of copper came from the Utah Copper property at Bingham, which yielded close to 16,500,000 pounds a month throughout the year. This is practically the same as the production in 1917, so that the decrease in the total amount of copper produced was due to the smaller operators in the state. Reports for the second quarter of the year showed that the Utah Copper Co. was producing a large amount of metal from the treatment of copper ores in the new leaching plant. Next to the Utah Copper, the Utah Consol-

idated was the largest copper producer, followed by the Ohio Copper Co., whose output was considerably less than in 1917. In the other districts the principal copper producers were the Utah Leasing Co. at Newhouse, the Iron Blossom in the Tintic district, the Ophir Hill at Ophir, the Columbus-Rexall at Alta, the Salt Lake Copper Co. near Tecoma, Nev., and the Tintic Standard in the Tintic region.

The mine output of lead decreased from 178,521,958 pounds in 1917 to 162,000,000 pounds in 1918, a decrease of over 9 per cent. The value of the output decreased from $15,352,388 to about $12,200,000. The Utah Apex at Bingham was by far the largest lead producer in the state. Other notable producers were the Eagle and Blue Bell, Silver King Coalition, Utah Consolidated, Daly-Judge, Ophir Hill Consolidated, Chief Consolidated, Cardiff, Horn Silver, and Silver King Consolidated.

There was a decrease of about 20 per cent in the production of recoverable zinc. The mine output decreased from 21,286,871 pounds in 1917 to about 17,500,000 pounds in 1918, and the value of the output from $2,171,261 to about $1,454,000. The principal producers of zinc were the Midvale Mineral Co. and the Childers Leasing Co., which treated tailings near Midvale; the Caldo Mining Co., at Frisco, the Daly-Judge, at Park City; and the Utah Apex and United States Mining Co. property at Bingham. The electrolytic plant of the Judge Mining & Smelting Co., at Park City, was in successful operation during the year, and the plant was being enlarged. Other zinc shipments were made from the Scranton, Lake View, Chief Consoldated, and Hidden Treasure. Part of the lead-zinc ore from Utah was shipped to the electrolytic plant at Great Falls, Mont.

In 1918 the mines of Utah produced approxmately 14,606,000 tons of ore, a decrease from 15,358,481 tons in 1917. Of this total, the Bingham district produced about 13,978,000 tons, against 14,150,394 tons in 1917. There was a decrease in the Tintic district, where 41 mines produced about 344,000 tons of ore, exclusive of iron ore, against 392,380 tons in 1917. The mines having an output of more than 4,000 tons during the year were the Dragon, Chief Consolidated, Iron Blossom, Eagle and Blue Bell, Tintic Standard, Centennial-Eureka, Grand Central, Mammoth, Colorado, Gold Chain, Gomini, and Victoria. The Tintic Milling Co. treated much ore locally and shipped bullion containing gold, silver, and copper. Shipments of ore and concentrate from the Park City region in 1918 amounted to about 90,000 tons, a decrease from 96,516 tons in 1917. Tabulation of the important mines gave an estimated output for the district of $77,395 in gold, 2,626,000 ounces of silver, 918,000 pounds of copper, 24,064,000 pounds of lead, and 2,650,000 pounds of recoverable zinc. The decrease was general, but the largest decline was in lead. Tooele county mines produced 99,000 tons in 1918, against 132,048 tons in 1917; the main producers were the Western Utah, Bullion Coalition, Ophir Hill Consolidated, and Ophir Coalition. About 39,000 tons of ore was shipped from the Big Cottonwood, Little Cottonwood, and American Fork districts, against a total of 51,813 tons in 1917. In Beaver county shipments increased from 64,532 tons in 1917 to about 67,000 tons in 1918. This included the large amount of low-grade lead tailings shipped by the Caldo Mining Co. Among the other producers was the Deer Trail mine, in the Ohio district, of Piute county.

Dividends paid by mining companies in Utah in 1918 for eleven months amounted to $13,319,521. Dividends were also paid by the United States Smelting Co., which controls mines at Eureka and Bingham.

SCARCITY OF LABOR CUTS OUTPUT OF IDAHO MINES

The value of the gold, silver, copper, lead, and zinc mined in Idaho in 1918, according to the estimate of C. N. Gerry, of the United States Geological Survey, Department of the Interior, was about $38,140,000, a decided decrease of $16,700,000 from the value in 1917. The decrease was marked in all the metals but gold, as well as in the total value of the output. Even the value of the silver, which increased in price during the year, was less by more than $600,000. Many of the mines, particularly the smaller ones, were handicapped on account of the scarcity of labor, and even the larger mines were at a great expense on account of the increases in cost of freight, treatment, and supplies. One of the encouraging features of the mining industry of Idaho was the successful operation of the Bunker Hill & Sullivan smelter and refinery at Kellogg. Toward the end of the year preparations were being made for the addition of two lead furnaces as well as other improvements in the roasting and refining departments.

The mine production of gold in Idaho increased from $804,809 in 1917 to about $867,000 in 1918. The most important gold production came from the Sherman and Corporal property, in Idaho county. Close to this was the output of the Gold Hill and Iowa mines, in Boise county. A considerable output of gold has its source in the copper ore from Mackay, in Custer county. Although the Boston and Idaho dredge at Idaho City was operated for a time during the year, the total gold from dredging operations was considerably decreased. The plant of the Kirtley Creek in Lemhi county, made only a small production previous to being dismantled, and the dredge at Pierce had only a slight output.

The mine output of silver decreased from 12,029,338 ounces in 1917 to about 9,595,000

ounces in 1918, an unusual decline of nearly 20 per cent, and the value decreased from $9,912,175 to about $9,286,000. Decreases amounting to 400,000 ounces or more were shown by the Hercules, Morning, Greenhill Cleveland, Caledonia, and Bunker Hill mines. Fortunately the Hecla, Tamarack & Custer, and Gold Hunter made better records. The largest silver producer of the state was the Hercules mine, at Burke, followed by the Hecla, near by, which took second place from the Bunker Hill & Sullivan, the third in rank. Other important silver producers were the Morning, Tamarack & Custer, Gold Hunter, and Caledonia. The mines in the Coeur d'Alene district produced about 8,600,000 ounces, or about 90 per cent of the total of the state.

The mine output of copper decreased from 7,827,574 pounds in 1917 to about 5,195,000 pounds in 1918. The value of the output decreased from $2,136,928 to about $1,286,000. largest producer, but did not uphold its record of the last few years. The National Copper mine, near Mullan, produced considerable copper from concentrate, and the Richmond mine, farther east, made shipments of crude ore. There were also smaller shipments from mines near Salmon, in Lemhi county.

The mine output of lead, which is the most abundant metal in idaho, decreased from 393,559,521 pounds in 1917 to about 300,274,000 pounds in 1918. The average price was somewhat lower, and the value of the output decreased from $33,846,119 to $22,760,000. The Bunker Hill & Sullivan was the largest lead producer, followed by the Hercules, Hecla, and Morning. Considerable lead was produced by the Tamarack & Custer, Gold Hunter, Consolidated Interstate Callahan, Caledonia, Sierra Nevada, and Last Chance, at Wardner. Of the total lead, the Coeur d'Alene district produced about 286,000,000 pounds. In other districts of the state large tonnages of lead ore and concentrate came from the Idaho Continental, Pittsburgh-Idaho, Latest Out, and Independence mines, near Ketchum, in Blaine county. The Greenhill Cleveland, formerly a large producer of both lead and zinc, was closed in the early part of the year. Toward the end of the year shipments from the Caledonia mine, near Wardner, were decidedly decreased. A notable production, however, came from both the Hecla and the Tamarack and Custer properties.

The mine output of recoverable zinc in Idaho decreased from 79,854,136 pounds in 1917 to approximately 47,000,000 pounds in 1918. This decrease of over 32,000,000 pounds was due largely to increased expenses and the lower price of spelter. One of the main decreases was made by the largest zinc producer in the state, the Consolidated Interstate Callahan, which was treating a large tonnage of accumulated tailings during the third quarter of the year, while development was progressing in the mine. The Success mine, which was formerly a large zinc producer, shipped only about one-fourth of its former output. Other zinc shipments were made from the Morning, Frisco, Hercules, and Hecla. The Douglas property, on Pine Creek, was not as productive as formerly on account of difficulty in transporting the ore, and the Surprise Consolidated, in the same district, was idle. Considerable shipments of zinc ore came from the Amazon-Manhattan, adjoining the Interstate Callahan, and in Blaine county shipments were made from the North Star and the Kusa property.

Dividends from Idaho mining companies for the first eleven months of 1918 amounted to about $7,007,105. Those for the Hercules and Bunker Hill & Sullivan have been estimated by the mining press.

ALASKA MINES DO WELL DESPITE MANY HANDICAPS

The mines of Alaska yielded in 1918 products worth $28,900,000, according to preliminary estimates prepared by G. C. Martin, of the U. S. Geological Survey, Department of the Interior. Although Alaska mining was so adversely affected by shortage of labor and shipping and by high cost of supplies that the value of the output fell nearly $12,000,000 from 1917, the production was still far greater than in any year before 1915. Alaska's chief mineral product is copper, of which 69,426,000 pounds, valued at $17,180,000, was mined in 1918. The gold output, worth $10,000,000, of which placers yielded $5,100,000, was $4,650,000 less than in 1917 and was the smallest since 1904. The mining of 77,000 tons of coal, worth $435,000, is significant as the only marked advance over the production of 1917, as by far the largest coal output in Alaska mining, and as the probable beginning of a substantial coal industry. Alaska also produced in 1918 silver worth $870,000; tin worth $90,000; lead worth $85,000; chrome ore, tungsten, palladium, platinum, and antimony aggregating $117,000; and petroleum, marble, gypsum, lime, and bricks aggregating $120,000. The total yield of Alaska mines since 1880 has been more than $419,000,000. Of this, gold was worth $302,000,000 and copper $105,800,000.

No Permit Needed to Sell Export Coal

Revocation of the ruling prohibiting the sale or delivery of coke for export by ocean transportation, except upon the prior issuance of a permit by the United States Fuel Administration, has been announced by the Fuel Administration.

Announcement of the change in procedure was made in an official order amending a previous one relative to the "price of coke for export by ocean transportation."

CARBON BLACK MANUFACTURERS QUIT CERTAIN GAS FIELDS

The annual saving of 26,000,000,000 cubic feet of natural gas, the equivalent of one-eighth of the entire domestic natural gas consumption of the United States, can be effected in a single industry in West Virginia by state regulation, which will be proposed to the Legislature of West Virginia at its coming session, beginning January 10 at Charleston, according to an announcement made by the United States Fuel Administration.

A movement is under way for West Virginia to continue the activities for natural gas conservation, which have been started by the United States Fuel Administration. All the plants in the vicinity of Grantsville, W. Va., which manufacture carbon black, otherwise known as lamp black, from natural gas, have voluntarily agreed to close down immediately. This agreement, which has just been effected, will stop the wasteful consumption of 15,000,000 cubic feet per day, which will be made available for immediate use this winter for domestic and public utility purposes.

The operators of these plants have agreed to manufacture their product hereafter in either Wyoming or Louisiana from wells too remote from populous centers to be available for other uses. The Fuel Administration has also effected arrangements for the manufacture from this gas which will be saved 5,000 gallons of gasoline daily, which has heretofore gone to waste.

Appeals have been made to the Fuel Administration by representatives of numerous communities which obtain their supply of natural gas from the West Virginia fields, to curtail the use of natural gas in certain lines of industry. The demands for natural gas throughout the country are greater than the available supply. The use of natural gas is a privilege enjoyed by about 10 per cent of our population. When present supplies are exhausted, the users of natural gas must return to the more expensive manufactured gas.

The Fuel Administration takes the position that where natural gas is available for domestic and industrial purposes, its unrestricted use in the manufacture of carbon black is a wasteful practice.

"Carbon black" is a term applied to a material deposited by the actual contact of a flame upon a metallic surface. Carbon black is now made by the wasteful process of incomplete combustion of natural gas —that is, the gas is simply burned in the open, the flame impinging against a metal plate, making the deposit known as carbon black. From one and one-eighth to one and one-half pounds of carbon black are made from each thousand cubic feet of gas burned. The heat contained in the gas is wasted, and only a small portion of the carbon content of the gas is utilized.

In the State of Ohio alone there are about 400,000 consumers of natural gas from West Virginia; Pennsylvania gets 43 per cent of the natural gas it uses from West Virginia, which also supplies 85 per cent of the natural gas used in Indiana and all of the natural gas used in Maryland.

PERSONALS

Messrs. J. B. Eldridge, Boise, Idaho, vice president of the Idaho Mining Association, and L. G. Magee of Boise, were recent callers at the Headquarters of the American Mining Congress. Mr. Eldridge is heavily interested in the production of gold.

Charles P. Reiniger, president of the Arizona Mining Association, an organization of producers affiliated with the Arizona Chapter of the American Mining Congress, spent January 3rd at the national headquarters of the Congress, discussing plans for enlarging the work of his organization along lines of mutual protection, purchasing and distribution of supplies, contracting, etc. Mr. Reiniger is a "live wire" and an enthusiastic organizer. He is completing plans for a state convention of the new mining association late in February.

J. F. Callbreath, secretary of The American Mining Congress, left Washington early in January for an extended western trip. He will attend the meeting of the Colorado Chapter, January 3 and 4, and a meeting of the Arizona Chapter, January 10. From there he will go to San Francisco to be present at the meeting of the California Metal Producers' Association, when a chapter of the Congress will be created for California. He expects to return to the Washington headquarters about February 1.

Bulkeley Wells, president of The American Mining Congress, attended the meeting of the California Metal Producers' Association, at San Francisco, January 17, assisting in the plans for the establishment of a California Chapter of the Congress.

John C. Howard, Director, The American Mining Congress, is spending several weeks in California.

Fuel Official Resigns

The resignation of Russell Hastings who, since December 31, 1917, had been connected with the United States Fuel Administration as assistant in distribution of bituminous coal and in direct charge of that work as it was related to public utilities, became effective December 17.

BUYERS' DIRECTORY

INDEX

COAL CRUSHERS

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Jeffrey Mfg. Co., Columbus, Ohio
Worthington Pump & Machinery Corp., 115 Broadway, New York City.

COAL CUTTERS

Goodman Mfg. Co., Chicago, Ill.
Jeffrey Mfg. Co., Columbus, Ohio

COAL HANDLING MACHINERY

Willis E. Holloway & Co., Cleveland, Ohio
Jeffrey Mfg. Co., Columbus, Ohio

COAL MINING MACHINERY

Goodman Mfg. Co., Chicago, Ill.
Jeffrey Mfg. Co., Columbus, Ohio

COAL WASHING MACHINERY

Jeffrey Mfg. Co., Columbus, Ohio

COCKS (Locomotive, Cylinder and Gauge)

The Lunkenheimer Co., Cincinnati, Ohio
Nicholson, W. H., & Co., Wilkes-Barre, Pa.
Ohio Brass Co., Mansfield, Ohio

COILS (Choke)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

COMPANY STORES (Coupons)

Allison Coupon Co., Indianapolis, Ind.

COMPRESSORS, AIR

General Electric Co., Schenectady, N. Y.
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago.
Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.
Randle Machinery Co., The, Cincinnati, Ohio
Worthington Pump & Machinery Corp., 115 Broadway, New York City.

CONCENTRATORS (Table)

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

CONCRETE MIXERS

Standard Scale & Supply Co., 1631 Liberty Avenue, Pittsburgh, Pa.

CONDENSERS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Worthington Pump & Machinery Corp., 115 Broadway, New York City

CONTROLLERS

General Electric Co., Schenectady, N. Y.
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

CONVEYORS, BELT

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Stephens-Adamson Mfg. Co., Aurora, Ill.

CONVEYORS, CHAIN FLIGHT

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Wilmot Engineering Co., Hazleton, Pa.

CONVEYORS, COAL

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

CONVEYORS AND ELEVATORS

Willis E. Holloway & Co., Cleveland, Ohio
Jeffrey Mfg. Co., Columbus, Ohio

CONVEYORS, PAN OR APRON

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

CONVEYORS, SCREW

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

CORE DRILLING

E. J. Longyear Co., Minneapolis, Minn.

COUPONS

Allison Coupon Co., Indianapolis, Ind.

COUPLINGS

Nicholson, W. H., & Co., Wilkes-Barre, Pa.

CRANES:

Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago

CRUSHERS, COAL

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago.
United Iron Works Co., Kansas City, Mo.
Worthington Pump & Machinery Corp., 115 Broadway, New York City.

CRUSHING PLANTS, COKE

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

CRUSHERS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago.
United Iron Works Co., Kansas City, Mo.
Worthington Pump & Machinery Corp., 115 Broadway, New York City.

CRANES

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

CROSS-OVER DUMPS

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Phillips Mine & Mill Supply Co., Pittsburgh, Pa.

CUTTER HEADS

Frank Prox Co. Terre Haute, Ind.

CYANIDING

DERRICKS AND DERRICK FITTINGS

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

DESIGNERS OF PLANTS

Willis E. Holloway & Co., Cleveland, Ohio
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

DIAMOND CORE DRILL CONTRACTING

Hoffman Bros., Punxsutawney, Pa.
Longyear Co., E. J., Minneapolis, Minn.

DOORS, AUTOMATIC MINE

American Mine Door Co., Canton, Ohio

DRAG LINES

Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago

DRILLS, CORE

Longyear Co., E. J., Minneapolis, Minn.

DRILLS, ELECTRIC

General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Union Electric Co., Pittsburgh, Pa.

DRILLS (Hand Operated Coal)

Ohio Brass Co., Mansfield, Ohio
Leetonia Tool Co., Leetonia, Ohio

DRILLS, PROSPECTING

Longyear Co., E. J., Minneapolis, Minn.

DRILLS, ROCK

General Electric Co., Schenectady, N. Y.
Pneumelectric Machine Co., Syracuse, N. Y.
Union Electric Co., Pittsburgh, Pa

DRUMS (Hoisting, Haulage)

Connellsville Mfg. & Mfg. Supply Co., Connellsville, Pa.

DUMPS, CROSS-OVER

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Phillips Mine & Mill Supply Co., Pittsburgh, Pa.

DUMP CARS

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

DUMPS (Rotary)

Wood Equipment Co., Chicago, Ill.

DYNAMOS

Goodman Mfg. Co., Forty-eighth Place and Halsted Street, Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Randle Machinery Co., The, Cincinnati, Ohio

ELECTRICAL APPARATUS

General Electric Co., Schenectady, N. Y.
Randle Machinery Co., The, Cincinnati, Ohio

ELECTRIC HOISTING MACHINERY

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

ELECTRIC LOCOMOTIVES

Goodman Mfg. Co., Forty-eighth Place and Halsted Street, Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Ohio Brass Co., Mansfield, Ohio

ELECTRIC MINE SUPPLIES

Electric Railway Equipment Co., Cincinnati, Ohio

ELECTRICAL SUPPLIES

Electric Service Supplies Co., 17th & Cambria St., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Union Electric Co., Pittsburgh, Pa.

ELEVATOR MACHINERY

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

ELEVATORS

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

ELEVATORS, BUCKET

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Stephens-Adamson Mfg. Co., Aurora, Ill.

ELIMINATORS

Nicholson, W. H. & Co., Wilkes-Barre, Pa.

ENGINES, GAS AND GASOLINE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Cleveland Belting & Mach. Co., The, Cleveland, Ohio.
Ironton Engine Co., Ironton, Ohio
Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.
Randle Machinery Co., The, Cincinnati, Ohio
Worthington Pump & Machinery Corp., 115 Broadway, New York, N. Y.

ENGINES (HOISTING AND HAULING)

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Ironton Engine Co., Ironton, Ohio
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago
Novo Engine Co., Lansing, Mich.
Randle Machinery Co., The, Cincinnati, Ohio
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.

ENGINES, OIL

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Ironton Engine Co., Ironton, Ohio
Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The, 1631 Liberty Ave., Pittsburgh, Pa.
Randle Machinery Co., The, Cincinnati, Ohio
Worthington Pump & Machinery Corp., 115 Broadway, New York, N. Y.

ENGINES, STEAM

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Ironton Engine Co., Ironton, Ohio
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.
Randle Machinery Co., The, Cincinnati, Ohio

ENGINEERS

Indiana Laboratories Co., Hammond, Ind.
Hunt, Robt., & Co., Insurance Exchange, Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Longyear, E. J., & Co., Minneapolis, Minn.

EXPLOSIVES

Atlas Powder Co., Wilmington, Del.
du Pont Powder Co., Wilmington, Del.
Equitable Powder Co., East Alton, Ill.
Hercules Powder Co., Wilmington, Del.

FANS, VENTILATING

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Vulcan Iron Works, Wilkes-Barre, Pa.

FEEDERS, ORE

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Stephens-Adamson Mfg. Co., Aurora, Ill.

FITTINGS (Ground)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

FROGS AND SWITCHES

Weir Frog Co., Cincinnati, Ohio

FURNACES, MECHANICAL ROASTING

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

GEARS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Jeffrey Mfg. Co., Columbus, Ohio
General Electric Co., Schenectady, N. Y.

GENERATORS AND GENERATING SETS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Randle Machinery Co., The, Cincinnati, Ohio

GONGS (Pneumatic Signal)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

GREASES

Ohio Grease Co., Loudenville, Ohio

GUIDES

Frank Prox Co., Terre Haute, Ind.

HANGERS (Insulated Trolley)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Ohio Brass Co., Mansfield, Ohio

HAULING ROPES

Hazard Mfg. Co., Wilkes-Barre, Pa.
Macomber & Whyte Rope Co., Kenosha, Wis.

HAULAGE SUPPLIES (Electric)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

HEADLIGHTS, ARC AND INCANDESCENT

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio

HITCHINGS

Macomber & Whyte Rope Co., Kenosha, Wis.

HOISTS, ELECTRIC

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Pneumelectric Machine Co., Syracuse, N. Y.
Randle Machinery Co., The, Cincinnati, Ohio
Vulcan Iron Works, Wilkes-Barre, Pa.

HOISTS, PORTABLE

Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.

HOISTS, STEAM

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Novo Engine Co., Lansing, Mich.
Holmes, Robt., & Bros., Inc., Danville, Ill.
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.
Randle Machinery Co., The, Cincinnati, Ohio
United Iron Works Co., Kansas City, Mo.
Vulcan Iron Works, Wilkes-Barre, Pa.

HOISTING ROPES

Connellsville Mfg. & Mine Supply Co., Connesville, Pa.
Hazard Mfg. Co., Wilkes-Barre, Pa.
Macomber & Whyte Rope Co., Kenosha, Wis.

HOISTS (Room & Gathering)

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

HOSE, AIR

Goodrich Co., The B. F., Akron, Ohio

HOSE (Rubber)

Goodrich Co., The B. F., Akron, Ohio

INSTRUMENTS, SURVEYING

Ainsworth & Sons, Wm., Denver, Colo.

INSULATING MATERIAL, ELECTRIC

Electric Railway Equipment Co., Cincinnati, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

INSULATING TAPE AND CLOTH

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

INSULATORS, FEEDER WIRE

Electric Railway Equipment Co., Cincinnati, Ohio
Ohio Brass Co., Mansfield, Ohio

INSULATORS, SECTION

Electric Railway Equipment Co., Cincinnati, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Ohio Brass Co., Mansfield, Ohio

INSULATORS (Porcelain)

Ohio Brass Co., Mansfield, Ohio

INSULATORS (Third Rail)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

INSULATORS (Trolley)

Ohio Brass Co., Mansfield, Ohio

INSULATED WIRE and CABLE

Hazard Mfg. Co., Wilkes-Barre, Pa.
American Steel & Wire Co., Chicago, Ill.
Roebling Sons, John A., Philadelphia, Pa.

JACKS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

JIGS

G. H. Elmore, 312 Parkway Bldg., Philadelphia, Pa.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

KITS (Roadmen's)

Leetonia Tool Co., Leetonia, Ohio

LAMPS, ARC AND INCANDESCENT

Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.
General Electric Co., Schenectady, N. Y.

LAMPS, ELECTRIC

General Electric Co., Schenectady, N. Y.
Leetonia Tool Co., (Carbide), Leetonia, Ohio

LAMPS, SAFETY

Leetonia Tool Co., Leetonia, Ohio

LEATHER BELTING

Chicago Belting Co., Chicago, Ill.

LEATHER (Valves, Packings, Specialties)

Chicago Belting Co., Chicago, Ill.

LIGHTNING ARRESTERS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

LOADING BOOMS

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

LOADING MACHINES

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

LOCOMOTIVES, ELECTRIC

General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Chicago, Ill.
Ironton Engine Co., Ironton, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

LOCOMOTIVES, GASOLINE

Ironton Engine Co., Ironton, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago
Vulcan Iron Works, Wilkes-Barre, Pa.

LOCOMOTIVES, RACK RAIL

Goodman Mfg. Co., Chicago, Ill.
Ironton Engine Co., Ironton, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago

LOCOMOTIVES, STEAM

Vulcan Iron Works, Wilkes-Barre, Pa.
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago

LOCOMOTIVES, STORAGE BATTERY

General Electric Co., Schenectady, N. Y.
Ironton Engine Co., Ironton, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago
Goodman Mfg. Co., Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

LUBRICATORS

Lunkenheimer Co., The, Cincinnati, Ohio
Ohio Grease Co., Loudenville, Ohio

MACHINE TOOLS

Randle Machine Co., The, Cincinnati, Ohio.

MATS AND MATTING

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

MILLS, STAMP

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Worthington Pump & Machinery Corp., 115 Broadway, New York City.

MINE DOORS, AUTOMATIC

American Mine Door Co., Canton, Ohio

MINING DRILL STEEL (Hollow and Solid)

International High Speed Steel Co., 99 Nassau Street, New York City

MINING MACHINES

Goodman Mfg. Co., Forty-eighth Place and Halsted Street, Chicago, Ill.

MINING MACHINES, CHAIN AND PUNCHER

Goodman Mfg. Co., Forty-eighth Place and Halsted Street, Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

MINING MACHINES (Electric)

Goodman Mfg. Co., Chicago, Ill.
Jeffrey Mfg. Co., 958 N. Fourth St., Columbus, Ohio.

MINING MACHINERY

H. Channon Co., Chicago, Ill.
Denver Quartz Mill & Crusher Co., Denver, Colo.
Machinery, Warehouse & Sales Co., Chicago, Ill.
Worthington Pump & Machinery Corp., 115 Broadway, N. Y., N. Y.

MINE CAR HITCHINGS

Hockensmith Wheel & Mine Car Co., Penn Station, Pa.
Phillips Mine & Mill Supply Co., Pittsburgh, Pa.
Macomber & Whyte Rope Co., Kenosha, Wis.

MINE CAR TRUCKS

Hockensmith Wheel & Mine Car Co., Penn Station, Pa.
Phillips Mine & Mill Supply Co., Pittsburgh, Pa.

MINE SIGNALS

American Mine Door Co., Canton, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

MINE SUPPLIES

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Leetonia Tool Co., Leetonia, Ohio

MINE TIMBER

Egyptian Timber Co., St. Louis, Mo.
Monongahela Wood Preserving Co., Pittsburgh, Pa.

MINING EQUIPMENT

Electric Railway Equipment Co., Cincinnati, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Leetonia Tool Co., Leetonia, Ohio
Wood Equipment Co., Cincinnati, Ohio

MINING MACHINE[ROPE

Macomber & Whyte Rope Co., Kenosha, Wis.

MOTORS

General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Chicago, Ill.

OIL AND GREASE CUPS

Lunkenheimer Co., The, Cincinnati, Ohio
Ohio Grease Co., Loudenville, Ohio

ORE, BUYERS AND SELLERS OF

Illinois Zinc Co., Peru, Ill.
Irvington Smelting and Refining Works, Irvington, N. J.
Phelps, Dodge Corporation, New York City

ORE CRUSHERS

Denver Quartz Mill & Crusher Co., Denver, Colo.
Worthington Pump & Machinery Corp., 115 Broadway, N. Y., N. Y.

ORE FEEDERS

Denver Quartz Mill & Crusher Co., Denver, Colo.

ORE SAMPLERS

Indiana Laboratories Co., Hammond, Ind.
Ledoux & Co., Inc., 99 John Street, New York
Lucius Pitkin, Inc., 47 Fulton Street, New York
Worthington Pump & Machinery Corp., 115 Broadway, N. Y., N. Y.

PERFORATED METALS

Chicago Perforating Co., Chicago, Ill.
Cross Engineering Co., Carbondale, Pa.
Laubenstein Mfg. Co., Ashland, Pa.

PICKING TABLES

Willis E. Holloway Co., Cleveland, Ohio
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

PIPE, CAST IRON

Hockensmith Mine Car Co., Penn Station, Pa.

PIPE (Wood)

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Randle Machinery Co., The, Cincinnati, Ohio
Pacific Tank & Pipe Co., San Francisco, Cal.

POWER TRANSMISSION MACHINERY

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

PROSPECTING DRILLS

Longyear Company, E. J., Minneapolis, Minn.

PULVERIZERS, COAL AND COKE

Jeffrey Mfg Co., 958 N. Fourth Street, Columbus, Ohio

PUMPS, CENTRIFUGAL

Aldrich Pump Co., Allentown, Pa.
Cleveland Belting & Machine y Co., Cleveland, Ohio
Randle Machinery Co., The, Cincinnati, Ohio
United Iron Works Co., Kansas City, Mo.
Worthington Pump & Machinery Corp., 115 Broadway, New York City

PUMPS, MILL

Aldrich Pump Co., Allentown, Pa.
Cleveland Belting & Machinery Co., Cleveland, Ohio
Randle Machinery Co., The, Cincinnati, Ohio
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.
Worthington Pump & Machinery Corp., 115 Broadway, N. Y., N. Y.

PUMPS, MINE

Aldrich Pump Co., Allentown, Pa.
Cleveland Belting & Machinery Co., Cleveland, Ohio
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Novo Engine Co., Lansing, Mich.
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.
United Iron Works, Kansas City, Mo.
Worthington Pump & Machinery Corp., 115 Broadway, N. Y., N. Y.

PUMPS (Electric)

Cleveland Belting & Machinery Co., Cleveland, Ohio
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

PUMPS (Gathering or Dip)

Cleveland Belting & Machinery Co., Cleveland, Ohio
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

PUMPS, PNEUMATIC AIR LIFT

Aldrich Pump Co., Allentown, Pa.
Cleveland Belting & Machinery Co., Cleveland, Ohio
Novo Engine Co., Lansing, Mich.
Worthington Pump & Machinery Corp., 115 Broadway, New York City.

PUMPS, POWER

Aldrich Pump Co., Allentown, Pa.
Cleveland Belting & Machinery Co., Cleveland, Ohio
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
General Electric Co., Schenectady, N. Y.
Randle Machinery Co., The, Cincinnati, Ohio
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.
Worthington Pump & Machinery Corp., 115 Broadway, New York City

PUMPS, STEAM

Aldrich Pump Co., Allentown, Pa.
Cleveland Belting & Machinery Co., Cleveland, Ohio
Randle Machinery Co., The, Cincinnati, Ohio
Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.
Worthington Pump & Machinery Corp., 115 Broadway, New York. N. Y.

PUMPS, VACUUM

Aldrich Pump Co., Allentown, Pa.
Cleveland Belting & Machinery Co., Cleveland, Ohio
Egyptian Iron Works, Murphysboro, Ill.
Worthington Pump & Machinery Corp., 115 Broadway, New York City

QUARRYING MACHINERY

Worthington Pump & Machinery Corp., 115 Broadway, New York, N. Y.

RAILS

Buckeye Rolling Mill Co., Steubenville, Ohio
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago, Ill.
Weir Frog Co., Cincinnati, Ohio

RAIL BONDS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio

RAILWAY SUPPLIES

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

RESPIRATORS

Goodrich Co., The B. F., Akron, Ohio

RAILWAY SUPPLIES

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

ROCK CRUSHERS

Worthington Pump & Machinery Corp., 115 Broadway, New York, N. Y.

ROCK DRILLS (Steel)

International High Speed Steel Co., 99 Nassau Street, New York

ROPE, MANILA AND JUTE

American Steel & Wire Co., Chicago, New York
Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.
Macomber & Whyte Rope Co., Kenosha, Wis.
Roebling Sons, John A., Philadelphia, Pa.

ROPE, TRANSMISSION

American Steel & Wire Co., Chicago, New York
Hazard Mfg. Co., Wilkes-Barre, Pa.
Roebling Sons., John A., Philadelphia, Pa.

ROPE, WIRE

American Steel & Wire Co., Chicago, New York
Hazard Mfg. Co., Wilkes-Barre, Pa.
Macomber & Whyte Rope Co., Kenosha, Wis.
Roebling Sons, John A., Philadelphia, Pa.

RUBBER GOODS (Hose, Air Drills, etc.)

H. Channon Co., Chicago, Ill.

SAFETY APPLIANCES

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Federal Sign System, Chicago, Ill.

SAMPLERS OF ORE

Indiana Laboratories Co., Hammond, Ind.
Ledoux & Co., Inc., 99 John Street, New York
Lucius Pitkin, Inc., 47 Fulton Street, New York City

SANDERS (Pneumatic Vacuum)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

SCALES

Standard Scale & Supply Co., The, 1631 Liberty Avenue, Pittsburgh, Pa.

SCREENS AND PERFORATED SHEETING

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Chicago Perforating Co., Chicago, Ill.
Holmes & Bros., Inc., Robt., Danville, Ill.
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Lubenstein Mfg. Co., Ashland, Pa.

SCREENS, REVOLVING

Chicago Perforating Co., Chicago, Ill.
Egyptian Iron Works, Murphysboro, Ill.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Worthington Pump & Machinery Corp., 115 Broadway, New York, N. Y.

SEARCHLIGHTS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

SEPARATORS (Steam)

Nicholson & Co., W. H., Wilkes-Barre, Pa.

SHAKER PLATES

Laubenstein Mfg. Co., Ashland, Pa.

SHEAVES (Hoisting)

Medart Patent Pulley Co., St. Louis, Mo.

SHOVELS

Wyoming Shovel Co., Wyoming, Pa.

SIGNS (Enameled Steel)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Federal Sign System, Chicago, Ill.

SIGNAL SETS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Federal Sign System, Chicago, Ill.

SMELTERS

Illinois Zinc Co., Peru, Ill.
Irvington Smelting & Refining Works, Irvington, N. J.

SKIPS

Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

SPELTER

Illinois Zinc Co., Peru, Ill.

SPLICE, CABLE

American Mine Door Co., Canton, Ohio
Ohio Brass Co., Mansfield, Ohio

SPLICE, INSULATOR

American Mine Door Co., Canton, Ohio

SPLICE, TROLLEY WIRE

American Mine Door Co., Canton, Ohio
Electric Railway Equipment Co., Cincinnati, Ohio
Ohio Brass Co., Mansfield, Ohio
Union Electric Co., Pittsburgh, Pa.

STEAM SHOVELS

Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago

STEEL (Mining)

International High Speed Steel Co., 99 Nassau Street, New York

STEEL (Rock Drill)

International High Speed Steel Co., 99 Nassau Street, New York

STEEL, REINFORCING

American Mine Door Co., Canton, Ohio

STORAGE BATTERIES

Edison Storage Battery Co., Orange, N. J.

STORES (company coupons)

Allison Coupon Co., Indianapolis, Ind.

SWITCHBOARDS, POWER

General Electric Co., Schenectady, N. Y.

SWITCHBOARDS, TELEPHONE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

SWITCHES (Disconnecting and Electric)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

SWITCHES, FROGS AND CROSSINGS

Union Electric Co., Pittsburgh, Pa.
Weir Frog Co., Cincinnati, Ohio

SWITCHES AND FROGS, TROLLEY

American Mine Door Co., Canton, Ohio
Electric Railway Equipment Co., Cincinnati, Ohio
Ohio Brass Co., Mansfield, Ohio
Union Electric Co., Pittsburgh, Pa.
Weir Frog Co., Cincinnati, Ohio

TANKS (Cylindrical, Acid Storage Gasoline, Lubricating Oil, etc.)

Pacific Tank & Pipe Co., San Francisco, Cal.

TIMBER (Mine)

Egyptian Timber Co., St. Louis, Mo.
Monongahela Wood Preserving Co., Pittsburgh, Pa.

TIPPLE EQUIPMENT

Willis E. Holloway Co., Cleveland, Ohio
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio
Phillips Mine & Mill Supply Co., Pittsburgh, Pa.
Worthington Pump & Machinery Corp., 115 Broadway, New York, N. Y.

TRACKS, PORTABLE, RAIL, ETC.

Weir Frog Co., Cincinnati, Ohio
West Virginia Rail Co., Huntington, W. Va.

TRANSFORMERS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.

TRAPS

Nicholson & Co., W. H., Wilkes-Barre, Pa.

TROLLEY (Hangers and Clamps)

Electric Railway Equipment Co., Cincinnati, Ohio
Ohio Brass Co., Mansfield, Ohio

TROLLEY, MATERIAL, OVERHEAD

Electric Railway Equipment Co., Cincinnati, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Ohio Brass Co., Mansfield, Ohio

TROLLEY WHEELS AND HARPS

Electric Railway Equipment Co., Cincinnati, Ohio
Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Ohio Brass Co., Mansfield, Ohio

TRUCKS

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

TUBES

Randle Machinery Co., The, Cincinnati, Ohio

TURBINES, STEAM

General Electric Co., Schenectady, N. Y.

VALVES

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.
Lunkenheimer Co., The, Cincinnati, Ohio
Ohio Brass Co., Mansfield, Ohio

WAGON LOADERS

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio

WEIGHERS

Indiana Laboratories Co., Hammond, Ind.
Ledoux & Co., Inc., New York
Lucius Pitkin, Inc., 47 Fulton Street, New York

WEIGHTS

Ainsworth, Wm. &. Son, Denver, Colo.

WIRE & CABLE

American Steel & Wire Co., Chicago, New York
Hazard Mfg. Co., Wilkes-Barre, Pa.
Roebling's Sons, The John A. Co., Phila., Pa.

WORMS (Worm Wheel and Racks)

Electric Service Supplies Co., 17th & Cambria Sts., Philadelphia, Pa.

ZINC (Rolled Sheets and Strips)

Illinois Zinc Co., Peru, Ill.

AMERICAN MINING CONGRESS

OFFICERS AND COMMITTEES, 1919

OFFICERS

BULKELEY WELLS, President
HARRY L. DAY, Vice-President
M. S. KEMMERER, Second Vice-President
GEORGE H. CROSBY, Third Vice-President
J. F. CALLBREATH, Secretary
JOHN T. BURNS, Western Secretary

EXECUTIVE COMMITTEE

BULKELEY WELLS — M. S. KEMMERER
E. P. MATTHEWSON

DIRECTORS

M. S. KEMMERER, New York
BULKELEY WELLS, Denver, Colo.
W. J. RICHARDS, Pottsville, Pa.
JOHN C. HOWARD, Salt Lake City, Utah
GEORGE H. CROSBY, Duluth, Minn.
SAMUEL A. TAYLOR, Pittsburgh, Pa.
L. A. FRIEDMAN, Lovelock, Nevada
CARL SCHOLZ, Chicago, Ill.
HARRY L. DAY, Wallace, Idaho
CHARLES S. KEITH, Kansas City, Mo.
WALTER DOUGLAS, New York
E. L. DOHENY, Los Angeles, Cal.
E. P. MATTHEWSON, New York

COMMITTEES, 1919

STATE VICE-PRESIDENTS

Alabama	Charles F. DeBardeleben	Birmingham
Alaska	John A. Davis	Fairbanks
Arizona	J. P. Hodgson	Bisbee
Arkansas	C. C. Woodson	Huntington
California	Albert Burch	San Francisco
Colorado	Bulkeley Wells	Telluride
Idaho	James F. McCarthy	Wallace
Indiana	Morton L. Gould	Indianapolis
Illinois	J. K. Dering	Chicago
Iowa	T. A. Dumont	Dumont
Kansas	Joseph Fletcher	Frontenac
Kentucky	Frank D. Rash	Earlington
Michigan	E. S. Grierson	Calumet
Massachusetts	W. R. Allen	Boston
Missouri	H. N. Taylor	Kansas City
Minnesota	W. J. Olcott	Duluth
Montana	C. F. Kelley	Butte
Nebraska	Frank A. Manley	Omaha
Nevada	Henry M. Rives	Reno
New Mexico	John M. Sulley	Hurley
New York	P. G. Beckett	New York City
Ohio	S. M. Dunbar	Steubenville
Oregon	Harold N. Lawrie	Portland
Oklahoma	I. G. Puterbaugh	McAlester
Pennsylvania	S. D. Warriner	Philadelphia
South Carolina	H. L. Scaife	Clinton
Tennessee	Wm. H. Lindsay	Nashville
Texas	D. C. Earnest	Dallas
Utah	John M. Hays	Salt Lake City
Virginia	Lee Long	Dante
Wisconsin	E. O. Granberg	Oshkosh
Wyoming	Patrick Sullivan	Cheyenne
West Virginia	C. H. Jenkins	Fairmont
Washington	Matt Bumgartner	Spokane

REVISION OF MINERAL LAND LAWS

E. B. KIRBY, St. Louis, Mo., *Chairman*

George E. Collins, Denver, Colo.
Thomas T. Read, New York City

ALASKAN AFFAIRS

Falcon Joslin, Fairbanks, Alaska
Henry R. Harriman, Cordova, Alaska
William Maloney, Nome, Alaska

WORKMEN'S COMPENSATION

T. L. LEWIS, Charleston, W. Va., *Chairman*

A. M. Ogle, Terre Haute, Ind.
W. R. Woodford, Cleveland, Ohio

CONFERENCE WITH FEDERAL TRADE COMMISSION

CHARLES M. MODERWELL, Chicago, Ill., *Chairman*

Hugh Shirkie, Terre Haute, Ind.
M. S. Kemmerer, New York City
Harry N. Taylor, Kansas City, Mo.
F. S. Landstreet, New York City
George M. Jones, Huntington, W. Va.

STANDARDIZATION OF ELECTRICAL EQUIPMENT

In Coal Mines

GEO. R. WOOD, Charleston, W. Va., *Chairman*

G. T. Watson, Fairmont, W. Va.
C. E. Watt, Windber, Pa.
L. M. Adler, Birmingham, Ala.

In Metal Mines

H. S. SANDS, Denver, Colo., *Chairman*

C. A. Chase, Denver, Colo.
Sanford B. Belden, Columbus, Ohio

MINERAL STATISTICS

OTTO RUHL, Joplin, Mo., *Chairman*

Fred'k Burbidge, Spokane, Wash.
J. C. Dick, Salt Lake City, Utah

FORESTRY RELATIONS

CARNEY HARTLEY, Denver, Colo., *Chairman*

F. J. Alexander, Denver, Colo.
C. H. Gibbs, Salt Lake City, Utah

MINE TAXATION

In Metal Mines

A. Scott Thompson, *Chairman*, Miami, Fla.
Paul Armitage, New York City
John C. Howard, Salt Lake City, Utah
E. L. Doheny, Los Angeles, Cal.
Geo. E. Holmes, New York City

MINING INVESTMENTS

A. G. MACKENZIE, Salt Lake City, Utah, *Chairman*

George H. Dern, Salt Lake City, Utah

UNIFORM MINE REPORTS AND ACCOUNTING

SAMUEL A. TAYLOR, Pittsburgh, Pa., *Chairman*

J. C. McKinley, Wheeling, W. Va.
J. C. Maben, Jr., Birmingham, Ala.

COMMITTEES ON STATE LEGISLATION

ALABAMA

Hary H. Coffin, *Chairman*, Birmingham, Ala.
B. F. Roden, Marvel, Ala.
Morris Bush, Birmingham, Ala.

ALASKA

William Maloney, Valdez, Alaska
Charles A. Sulzer, Sulzer, Alaska
W. T. Burns, Fairbanks, Alaska

ARIZONA

L. S. Cates, *Chairman*, Ray, Ariz.
J. P. Hodgson, Bisbee, Ariz.
Norman Carmichael, Clifton, Ariz.

CALIFORNIA

Lionel T. Barneson, Los Angeles, Cal.
Charles E. Knox, Berkeley, Cal.
F. Chappelett, Los Angeles, Cal.

COLORADO

R. S. Ellison.....Denver, Colo.
S. D. Nicholson.....Leadville, Colo.
M. B. Tomblin.....Denver, Colo.

IDAHO

James F. McCarthy, *Chairman*.....Wallace, Idaho
Jerome J. Day.....Moscow, Idaho
Ravenel Macbeth.....Mackey, Idaho

KANSAS

Jos. Fletcher, *Chairman*.....Frontenac, Kans.
Francis Keegan.....Pittsburgh, Kans.
Ira Clemens.....Pittsburgh, Kans.

KENTUCKY

H. L. Tucker, *Chairman*.....Central City, Ky.
Alexander Blair, Jr.....Baskett, Ky.
F. V. Ruckman.....Providence, Ky.

MICHIGAN

Chas. E. Lawrence, *Chairman*.....Palatka, Mich.
E. C. Bowers.....Iron River, Mich.
Rudolph Ericson.....Iron River, Mich.

MINNESOTA

Charles W. Potts, *Chairman* Deerwood, Minn.
E. J. Maney.....Duluth, Minn.
Clement K. Quinn.....Duluth, Minn.

MISSOURI

W. L. Schmick, *Chairman*.....St. Louis, Mo.
Thos. M. Jenkins.....St. Louis, Mo.
W. D. Hoag.....Joplin, Mo.

MONTANA

John Gillie, *Chairman*.....Butte, Mont.
C. W. Goodale.....Butte, Mont.
Dr. T. A. Gregg.....Butte, Mont.

NEVADA

Henry M. Rives, *Chairman*.....Reno. Nev.
C. B. Lakeman.....McGill, Nev.
A. A. Codd.....Reno, Nev.

NEW MEXICO

T. H. O'Brien, *Chairman*.....Dawson, N. Mex.
George H. Utter.....Silver City, N. Mex.
John Sully.....Santa Rita, N. Mex.

NEW YORK

J. R. Finley, *Chairman*.....New York City
Edwin O. Holter.....New York City
Chas. H. Smith.....New York City

OKLAHOMA

Dorset Carter, *Chairman*.....Oklahoma City, Okla.
J. F. Robinson.....Miami, Okla.
J. G. Puterbaugh.....McAlester, Okla.
J. J. Shea.....Tulsa, Okla.

OHIO

W. R. Woodford, *Chairman*.....Cleveland, Ohio
F. M. Kirk.....Cleveland, Ohio
B. Lee Hutchinson.....Cincinnati, Ohio

OREGON

H. N. Lawrie, *Chairman*.....Portland, Ore.
A. M. Swartley.....Corvallis. Ore.
H. M. Parks.....Corvallis, Ore.

PENNSYLVANIA

C. F. Huber, *Chairman*.....Wilkes-Barre, Pa.
W. J. Faux.....Philadelphia, Pa.
J. C. McDowell.....Pittsburgh, Pa.

TENNESSEE

D. C. Campbell, *Chairman*.....Knoxville, Tenn.
Jesse W. Overton.....Nashville, Tenn.
H. B. Bonney.....Chattanooga, Tenn.

UTAH

L. B. McCormick.....Salt Lake City, Utah
C. E. Allen.....Salt Lake City, Utah
A. G. Mackenzie.....Salt Lake City, Utah

VIRGINIA

Lee Long, *Chairman*.....Dante, Va.
M. M. Caldwell.....Roanoke, Va.
J. N. Harmon.....Tazewell, Va.

WASHINGTON

E. C. Smith, *Chairman*.....Seattle, Wash.
Matt Baumgartner.....Spokane, Wash.
J. W. McBride.....Spokane, Wash.

WEST VIRGINIA

G. H. Caperton, *Chairman*.....Charleston, W. Va.
E. T. Hitchman.....Wheeling, W. Va.
John M. Wolfe.....Fairmont, W. Va.
A. J. Dalton.....Huntington, W. Va.
Daniel Howard.....Clarksburg, W. Va.

WISCONSIN

H. O. Granberg, *Chairman*.....Oshkosh, Wis.
John M. Whitehead.....Janesville, Wis.
H. C. George.....Platteville, Wis.

WYOMING

P. J. Quealy, *Chairman*.....Kemmerer, Wyo.
John D. Clark.....Cheyenne, Wyo.
W. D. Brennan.....Cheyenne, Wyo.
Frank G. Curtis.....Casper, Wyo.
L. A. Reed.....Casper, Wyo.

COMMITTEES ON FEDERAL LEGISLATION

ALABAMA

W. E. Henley, *Chairman*.....Birmingham, Ala.
J. C. Maben, Jr.....Birmingham, Ala.
J. B. McClary.....Birmingham, Ala.

ARIZONA

L. S. Cates, *Chairman*.....Bisbee, Ariz.
Norman Carmichael.....Clifton, Ariz.
J. E. Curry.....Bisbee, Ariz.

CALIFORNIA

Charles E. Knox.....Berkeley, Cal.
J. Ross Clark.....Los Angeles, Cal.
Allard D'Heur.....San Francisco, Cal.

COLORADO

J. F. Welborn.....Denver, Colo.
Irving T. Snyder.....Denver, Colo.
L. L. Aitken.....Denver, Colo.

GEORGIA

S. W. McCallie, *Chairman*.....Atlanta, Ga.
N. P. Pratt.....Atlanta, Ga.
B. M. Hall.....Atlanta, Ga.

ILLINOIS

Carl Scholz, *Chairman*.....Chicago, Ill.
W. S. Bogle.....Chicago, Ill.
Geo. H. Cushing.....Chicago, Ill.
H. C. Adams.....Chicago, Ill.

INDIANA

Phillip Penna, *Chairman*.....Terra Haute, Ind.
Hugh Shirkie.....Terra Haute, Ind.
J. C. Kolsem.....Terra Haute, Ind.

IDAHO

Irvin E. Rookwell, *Chairman*.....Bellevue, Idaho
Ravenel Macbeth.....Mackay, Idaho
Eugene R. Day.....Wallace, Idaho

KENTUCKY

C. W. Taylor, *Chairman*.....Greenville, Ky.
J. A. Smith.....Central City, Ky.
Clifford M. Roehrig.....Ashland, Ky.

MICHIGAN

O. C. Davidson, *Chairman*.....Iron Mountain, Mich.
Jas. S. Wall.....Iron River, Mich.
J. E. Jopling.....Ishpeming, Mich.

MINNESOTA

Francis J. Webb, *Chairman*.....Duluth, Minn.
W. W. Prindle.....Minneapolis, Minn.
W. G. Swart.....Duluth, Minn.
Alfred Pillsbury.....Minneapolis, Minn.
Geo. H. Warren.....Minneapolis, Minn.

COMMITTEES ON FEDERAL LEGISLATION (Continued)

MISSOURI

Victor Rakowsky, *Chairman*	Joplin, Mo.
D. D. Hoag	Joplin, Mo.
Otto Ruhl	Joplin, Mo.

NEW MEXICO

C. T. Brown, *Chairman*	Locorro, N. Mex.
G. A. Kaseman	Albuquerque, N. Mex.
Rees H. Beddon	Gallup, N. Mex.
John M. Sulley	Hurley, N. Mex.
T. H. Obrien	Dawson, N. Mex.

NEW YORK

J. Parke Channing, *Chairman*	New York City
J. R. Finlay	New York City
F. McM. Stanton	New York City
A. C. Morrison	New york City.
Wm. Y. Westervelt	New York City

OHIO

B. Lee Hutchinson, *Chairman*	Cincinnati, Ohio
John M. Wright	Cincinnati, Ohio
H. E. Willard	Cleveland, Ohio
W. R. Woodford	Cleveland, Ohio
F. M. Kirk	Cleveland, Ohio

OKLAHOMA

H. W. Adams, *Chairman*	McAlester, Okla.
J. G. Puterbaugh	McAlester, Okla.
J. F. Robinson	Miami, Okla.

OREGON

H. M. Parks, *Chairman*	Corvallis, Ore.
J. Frank Watson	Portland, Ore.
F. W. Schofield	Sumpter, Ore.

PENNSYLVANIA

H. H. Lineaweaver, *Chairman*	Philadelphia, Pa.
C. R. Wentz	Philadelphia, Pa.
J. C. McDowell	Pittsburgh, Pa.
F. M. Chase	Wilkes-Barre, Pa.
C. T. Huber	Wilkes-Barre, Pa.

TENNESSEE

J. H. Jones, *Chairman*	Chattanooga, Tenn.
John W. Fry	Columbia, Tenn.
C. E. Buek	Chattanooga, Tenn.

UTAH

George Dern, *Chairman*	Salt Lake City, Utah
Imer Pett	Salt Lake City, Utah
Walter Fitch	Eureka, Utah
G. W. Lambourne	Salt Lake City, Utah
A. G. Mackenzie	Salt Lake City, Utah

WEST VIRGINIA

I. C. White, *Chairman*	Morgantown, W. Va.
John A. Kelly	Omar, W. Va.
Harry B. Clark	Fairmont, W. Va.
John Laing	Charleston, W. Va.

WISCONSIN

John M. Whitehead, *Chairman*	Janesville, Wis.
Geo. S. Whyte	Kenosha, Wis.
H. C. George	Plattville, Wis.

WYOMING

Patrick Sullivan, *Chairman*	Cheyenne, Wyo.
R. M. Bartholomew	Casper, Wyo.
John D. Clark	Cheyenne, Wyo.
John P. Leeper	Casper, Wyo.
J. R. Penn	Casper, Wyo.

Results

If it had not been for the untiring effort of THE AMERICAN MINING CONGRESS, many clauses would have been retained in the Revenue Bill that would have worked vast hardship for your company.

Do you know **WHY** these inequalities were removed?

Do you know WHY the Senate Finance Committee accepted SIX out of EIGHT of the Recommendations made to it in behalf of the Mining Industry, by THE AMERICAN MINING CONGRESS?

The Reason:

Members of the Senate Finance Committee are fully aware that The American Mining Congress is composed of the fairest, most representative mining men in the country; they know that when practically four thousand of these men agree that certain clauses in that bill would discriminate against the mining industry, there is reason for readjustment. They know that The American Mining Congress is not a partisan organization, that it represents **ALL** branches of mining, and that a recommendation made by it carries the best thought of the leaders in the world's greatest industry.

Results Count!

The American Mining Congress

THE AMERICAN MINING CONGRESS is a voluntary association supported by the fees and dues of its members. It is striving to bring about:

First—Safety and efficiency in mining operations.

Second—Intelligent conservation with a view to the highest utilization and the prevention of waste of mineral resources.

Third—The protection of mining investors against fraud and misrepresentation; the stimulation of investment in real mining and to demonstrate that mining is a business and not a gamble.

Fourth—Uniformity in state laws governing mining operations carried on under like conditions.

Fifth—Such federal cooperation through research and investigation as will solve those problems of production, treatment and transportation which are essential to the highest development of the Mining Industry.

Sixth—A solution of the economic problems underlying the coal industry

Seventh—A more complete cooperation between miner and operator through the settlement of disputes by the economical rule of reason, rather than by the wasteful method of strikes and lockouts, and to foster in every possible way those conditions which make for just, considerate and helpful employers and well paid, efficient and loyal workmen.

If you are interested in this work, the appended application blank will show the way to help. Come in and bring the neighbor who would join this movement. Mail application to

THE AMERICAN MINING CONGRESS

Munsey Building, Washington, D. C.

APPLICATION FOR MEMBERSHIP

I desire to be enrolled as a member of the

AMERICAN MINING CONGRESS

and herewith enclose $.....membership fee and dues for the year 1917 ($2.00 of which is designated as subscription to the MINING CONGRESS JOURNAL).

Name .....

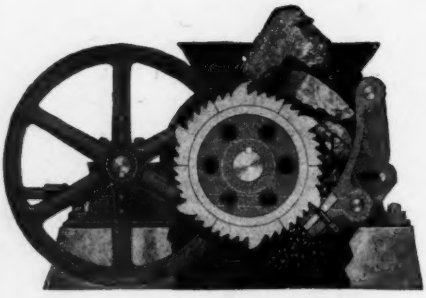
Address.....

.....

Associate membership		**(Admission fee**			**$1.00**		**Annual dues**		**$2.00)**	**Total**	**$3.00**
Active	"	(	"	"	**15.00**	"	"	**10.00)**	"		**25.00**
Life	"	-	-	-	-	-	-	-	-	-	**100.00**

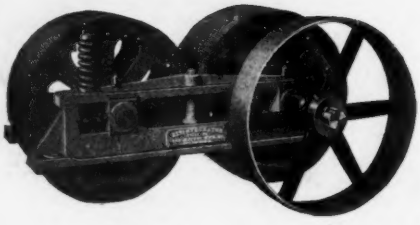
INDEX TO ADVERTISERS

JEFFREY
COAL CRUSHERS



SINGLE ROLL COAL CRUSHER

A Single Operation Reduces Run-of-Mine or Lump Coal to the proper sizes for stoker use.



Double Roll Disintegrator With Safety Spring Toggle

For Preliminary to Drying and Pulverizing in Pulverized Fuel Plants. An Ideal Machine for sizing material to about 3/8" and finer when a small amount of fines is desirable.

Jeffrey Crushers are giving splendid service in Copper Smelting Plants, Power Plants, Coaling Stations, Coal Mines, etc.

Write for Bulletin No. 141-A, giving full particulars. Also ask for Catalogs on our complete line of Elevating and Conveying Machinery, Coal and Ashes Handling Equipment, Etc.

THE JEFFREY MFG. CO., 958 NORTH 4TH ST., COLUMBUS, OHIO

BRANCHES:

New York Boston Charleston, W. Va. Philadelphia Scranton Pittsburgh
Chicago St. Louis Dallas Birmingham Milwaukee Montreal Cleveland

Denver Office: First National Bank Building **Seattle Office: L. C. Smith Building**